

# EXHIBIT A



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(12) **United States Design Patent** (10) **Patent No.:** **US D865,723 S**  
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(54) **ARRAY MICROPHONE ASSEMBLY**(56) **References Cited**(71) Applicant: **Shure Acquisition Holdings, Inc.**,  
Niles, IL (US)

## U.S. PATENT DOCUMENTS

1,965,830 A 7/1934 Hammer  
 2,521,603 A 9/1950 Prew  
 (Continued)

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## FOREIGN PATENT DOCUMENTS

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CA 2505496 10/2006  
 CA 2838856 A1 12/2012  
 (Continued)

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## OTHER PUBLICATIONS

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 No. 15/631,310, filed on Jun. 23, 2017, now  
 abandoned, which is a continuation of application No.  
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Farabow, Garrett & Dunner LLP(51) **LOC (12) Cl.** ..... **14-01**(52) **U.S. Cl.** ..... **D14/225; D14/209**

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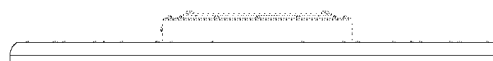
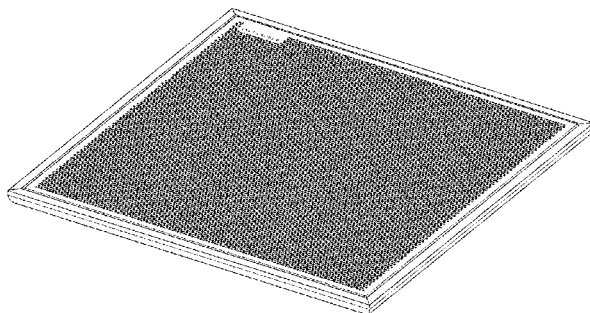
See application file for complete search history.

(57) **CLAIM**

The ornamental design for an array microphone assembly, as  
 shown and described.

**DESCRIPTION**

FIG. 1 is a front, top, right perspective view of an array  
 microphone assembly, showing the new design;  
 FIG. 2 is a rear, bottom, left perspective thereof;  
 FIG. 3 is a top plan view thereof;  
 FIG. 4 is a bottom plan view thereof;  
 FIG. 5 is a front view thereof; and,  
 FIG. 6 is a left side view thereof.  
 The broken lines of even length shown in the drawings  
 illustrate portions of the array microphone assembly that  
 form no part of the claimed design.

**1 Claim, 5 Drawing Sheets**

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## Related U.S. Application Data

14/701,376, filed on Apr. 30, 2015, now Pat. No.  
9,565,493.

(56)

## References Cited

## U.S. PATENT DOCUMENTS

2,533,565 A	12/1950	Eichelman	5,297,210 A	3/1994	Julstrom	
2,840,181 A	6/1958	Wildman	5,322,979 A	6/1994	Cassity et al.	
2,912,605 A	11/1959	Tibbetts	5,323,459 A	6/1994	Hirano	
2,938,113 A	5/1960	Schnell et al.	5,335,011 A	8/1994	Addeo	
2,950,556 A *	8/1960	Larios ..... A47G 1/0633 40/788	5,359,374 A *	10/1994	Schwartz ..... A47G 1/0616 40/455	
3,019,854 A	2/1962	O'Bryant	5,371,789 A	12/1994	Hirano	
3,143,182 A	8/1964	Sears et al.	5,383,293 A	1/1995	Royal	
3,161,975 A	12/1964	McMillan	5,384,843 A	1/1995	Masuda	
3,205,601 A	9/1965	Gawne et al.	5,396,554 A	3/1995	Hirano	
3,509,290 A	4/1970	Mochida et al.	5,400,413 A	3/1995	Kindel	
3,755,625 A	8/1973	Maston	D363,045 S	10/1995	Phillips et al.	
3,857,191 A	12/1974	Sadorus	5,473,701 A	12/1995	Cezanne	
3,906,431 A	9/1975	Clearwaters	5,513,265 A	4/1996	Hirano	
3,938,617 A	2/1976	Forbes	5,525,765 A	6/1996	Freiheit	
3,941,638 A	3/1976	Horky et al.	5,550,924 A	8/1996	Helf	
4,008,408 A	2/1977	Kodama	5,574,793 A	11/1996	Hirschhorn	
4,029,170 A *	6/1977	Phillips ..... H04R 1/02 181/155	5,602,962 A	2/1997	Kellermann	
4,032,725 A	6/1977	McGee	5,633,936 A	5/1997	Oh	
4,070,547 A	1/1978	Dellar	5,661,813 A	8/1997	Shimauchi	
4,072,821 A	2/1978	Bauer	5,673,327 A	9/1997	Julstrom	
4,096,353 A	6/1978	Bauer	5,687,229 A	11/1997	Sih	
4,131,760 A	12/1978	Christensen	5,706,344 A	1/1998	Finn	
4,184,048 A	1/1980	Alcaide	D392,977 S	3/1998	Kim	
4,198,705 A	4/1980	Massa	D394,061 S	5/1998	Fink	
D255,234 S	6/1980	Wellward et al.	5,761,318 A	6/1998	Shimauchi	
D256,015 S	7/1980	Doherty	5,787,183 A	7/1998	Chu	
4,212,133 A	7/1980	Lufkin	5,796,819 A	8/1998	Romesburg	
4,237,339 A	12/1980	Bunting	5,848,146 A	12/1998	Slattery	
4,244,096 A	1/1981	Kashichi	5,870,482 A	2/1999	Loeppert et al.	
4,254,417 A	3/1981	Speiser	5,888,412 A	3/1999	Sooriakumar et al.	
4,305,141 A	12/1981	Massa	6,035,962 A	3/2000	Lin	
4,308,425 A	12/1981	Momose	6,041,127 A	3/2000	Elko	
4,311,874 A	1/1982	Wallace, Jr.	6,049,607 A	4/2000	Marash	
4,330,691 A	5/1982	Gordon	D424,538 S	5/2000	Hayashi et al.	
4,334,740 A	6/1982	Wray	6,069,961 A	5/2000	Nakazawa	
4,365,449 A	12/1982	Liautaud	6,125,179 A	9/2000	Wu	
4,414,433 A	11/1983	Horie	D432,518 S	10/2000	Muto	
4,436,966 A	3/1984	Botros	6,137,887 A	10/2000	Anderson	
4,449,238 A	5/1984	Lee	6,144,746 A	11/2000	Azima et al.	
4,466,117 A	8/1984	Goerike	6,173,059 B1	1/2001	Huang	
4,485,484 A	11/1984	Flanagan	6,198,831 B1	3/2001	Azima et al.	
4,489,442 A	12/1984	Anderson	6,205,224 B1	3/2001	Underbrink	
4,518,826 A	5/1985	Caudill et al.	6,215,881 B1	4/2001	Azima	
4,521,908 A	6/1985	Miyaji	6,266,427 B1	7/2001	Mathur	
4,566,557 A	1/1986	Lemaitre	6,285,770 B1	9/2001	Azima et al.	
4,593,404 A	6/1986	Bolin	6,329,908 B1	12/2001	Freska	
D285,067 S *	8/1986	Delbuck ..... D14/209	6,332,029 B1	12/2001	Azima	
4,653,102 A	3/1987	Hansen	D453,016 S	1/2002	Nevill et al.	
4,658,425 A	4/1987	Julstrom	6,393,129 B1	5/2002	Conrad et al.	
4,669,108 A	5/1987	Deinzer	6,442,272 B1	8/2002	Osovets	
4,696,043 A	9/1987	Iwahara	6,449,593 B1	9/2002	Valve	
4,712,231 A	12/1987	Julstrom	6,488,367 B1	12/2002	Debasis et al.	
4,741,038 A	4/1988	Elko	6,505,057 B1	1/2003	Finn	
4,752,961 A	6/1988	Kahn	6,556,682 B1	4/2003	Gilloire	
4,815,132 A	3/1989	Minami	6,704,422 B1	3/2004	Jensen	
4,860,366 A	8/1989	Fukushi	D489,707 S	5/2004	Kobayashi	
4,881,135 A	11/1989	Heilweil	6,731,334 B1	5/2004	Maeng	
4,903,247 A	2/1990	Van Gerwen	6,741,720 B1	5/2004	Myatt	
4,923,032 A	5/1990	Nuernberger	6,757,393 B1 *	6/2004	Spitzer ..... H04R 5/02 381/77	
4,928,312 A	5/1990	Hill	6,768,795 B2	7/2004	Feltstrom	
4,969,197 A	11/1990	Takaya	6,885,750 B2	4/2005	Egelmeers	
5,038,935 A	8/1991	Wenkman et al.	D504,889 S	5/2005	Andre et al.	
5,121,426 A	6/1992	Baumhauer	6,895,093 B1	5/2005	Ali	
D329,239 S	9/1992	Hahn	6,931,123 B1	8/2005	Hughes	
5,214,709 A	5/1993	Ribic	6,944,312 B2	9/2005	Mason	
D340,718 S	10/1993	Leger et al.	6,968,064 B1	11/2005	Ning	
D345,346 S	3/1994	Alfonso et al.	6,990,193 B2	1/2006	Beaucoup	
D345,379 S	3/1994	Chan	6,993,126 B1	1/2006	Kyrylenko	
			6,993,145 B2	1/2006	Combist	
			7,003,099 B1	2/2006	Zhang	
			7,031,269 B2	4/2006	Lee	
			7,035,415 B2	4/2006	Belt	
			7,054,451 B2	5/2006	Janse	
			D526,643 S	8/2006	Ishizaki	
			D527,372 S	8/2006	Allen	
			7,092,516 B2	8/2006	Furuta	
			7,092,882 B2	8/2006	Arrowood	

## US D865,723 S

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(56)

## References Cited

## U.S. PATENT DOCUMENTS

7,098,865 B2	8/2006	Christensen	8,515,089 B2	8/2013	Nicholson
7,120,269 B2	10/2006	Lowell	8,553,904 B2	10/2013	Said
D542,543 S	5/2007	Bruce	8,583,481 B2	11/2013	Viveiros
D546,318 S	7/2007	Yoon et al.	8,600,443 B2	12/2013	Kawaguchi
D547,748 S	7/2007	Tsuge	8,605,890 B2	12/2013	Zhang
D549,673 S	8/2007	Niitsu	8,631,897 B2	1/2014	Stewart, Jr. et al.
7,269,263 B2	9/2007	Dedieu	8,638,951 B2	1/2014	Zurek
D552,570 S	10/2007	Niitsu	D699,712 S	2/2014	Boume
D566,685 S	4/2008	Koller et al.	8,644,477 B2	2/2014	Gilbert
7,359,504 B1	4/2008	Reuss	8,654,990 B2	2/2014	Faller
7,387,151 B1	6/2008	Payne	8,660,274 B2	2/2014	Wolff
D587,709 S	3/2009	Niitsu et al.	8,660,275 B2	2/2014	Buck
D589,605 S	3/2009	Reedy et al.	8,670,581 B2	3/2014	Harman
7,503,616 B2	3/2009	Linhard	8,672,087 B2	3/2014	Stewart, Jr. et al.
7,536,769 B2	5/2009	Pedersen	8,676,728 B1	3/2014	Velusamy
D595,736 S	7/2009	Son et al.	8,744,069 B2	6/2014	Cutler
7,565,949 B2	7/2009	Tojo	8,811,601 B2	8/2014	Mohammad
D599,553 S	9/2009	Shapiro	8,818,002 B2	8/2014	Tashev
7,660,428 B2	2/2010	Rodman	8,842,851 B2	9/2014	Beaucoup
D613,338 S	4/2010	Marukos	8,855,326 B2	10/2014	Derkx
7,701,110 B2	4/2010	Fukuda et al.	8,855,327 B2	10/2014	Tanaka
D614,871 S	5/2010	Tang et al.	8,873,789 B2	10/2014	Bigeh
7,724,891 B2	5/2010	Beaucoup	D717,272 S	11/2014	Kim et al.
7,747,001 B2	6/2010	Kellermann	8,886,343 B2	11/2014	Ishibashi
7,756,278 B2	7/2010	Moorer	8,893,849 B2	11/2014	Hudson
7,831,035 B2	11/2010	Stokes	8,903,106 B2	12/2014	Meyer
7,831,036 B2	11/2010	Beaucoup	8,942,382 B2	1/2015	Elko
D636,188 S	4/2011	Kim et al.	D725,631 S	3/2015	McNamara
7,925,006 B2	4/2011	Hirai	D726,144 S	4/2015	Kang
7,925,007 B2	4/2011	Stokes	9,002,028 B2	4/2015	Haulick
7,970,123 B2	6/2011	Beaucoup	D729,767 S	5/2015	Lee et al.
7,970,151 B2	6/2011	Oxford	9,094,496 B2	7/2015	Teutsch
D642,385 S	8/2011	Lee et al.	D737,245 S	8/2015	Fan et al.
7,991,167 B2	8/2011	Oxford	9,113,247 B2	8/2015	Chatlani
7,995,768 B2	8/2011	Miki	9,126,827 B2	9/2015	Hsieh et al.
8,005,238 B2	8/2011	Tashev	9,129,223 B1	9/2015	Velusamy
8,019,091 B2	9/2011	Burnett	9,172,345 B2	10/2015	Kok
8,064,629 B2	11/2011	Jiang	D743,376 S	11/2015	Kim
8,085,947 B2	12/2011	Haulick	D743,939 S	11/2015	Seong
8,098,842 B2	1/2012	Florencio	9,215,327 B2	12/2015	Bathurst
8,098,844 B2	1/2012	Elko	9,215,543 B2	12/2015	Sun
8,103,030 B2	1/2012	Barthel	9,226,088 B2	12/2015	Pandey et al.
8,130,969 B2	3/2012	Buck	9,237,391 B2	1/2016	Benesty
8,130,977 B2	3/2012	Chu	9,247,367 B2	1/2016	Nobile
8,135,143 B2	3/2012	Ishibashi	9,253,567 B2	2/2016	Morcelli
8,175,291 B2	5/2012	Chan	9,264,553 B2	2/2016	Pandey
8,184,801 B1	5/2012	Hamalainen	9,294,839 B2	3/2016	Lambert
8,189,765 B2	5/2012	Nishikawa	9,301,049 B2	3/2016	Elko
8,189,810 B2	5/2012	Wolff	D754,103 S	4/2016	Fischer et al.
8,199,927 B1	6/2012	Raftery	9,319,532 B2	4/2016	Bao
8,204,198 B2	6/2012	Adeney	9,319,799 B2	4/2016	Salmon et al.
8,213,596 B2	7/2012	Beaucoup	9,326,060 B2	4/2016	Nicholson
8,213,634 B1	7/2012	Daniel	9,338,549 B2	5/2016	Haulick
8,219,387 B2	7/2012	Cutler	9,357,080 B2	5/2016	Beaucoup
8,229,134 B2	7/2012	Duraiswami	9,403,670 B2	8/2016	Schelling et al.
8,233,352 B2	7/2012	Beaucoup	9,462,378 B2	10/2016	Kuech
8,249,273 B2	8/2012	Inoda	9,479,627 B1	10/2016	Rung
8,275,120 B2	9/2012	Stokes, III	9,479,885 B1	10/2016	Ivanov
8,284,949 B2	10/2012	Farhang	9,489,948 B1	11/2016	Chu
8,286,749 B2	10/2012	Stewart, Jr. et al.	9,510,090 B2	11/2016	Lissek
8,290,142 B1	10/2012	Lambert	9,516,412 B2	12/2016	Shigenaga
8,297,402 B2	10/2012	Stewart et al.	9,560,451 B2	1/2017	Eichfeld
8,331,582 B2	12/2012	Steele	9,565,493 B2	2/2017	Abraham
8,385,557 B2	2/2013	Tashev	9,578,413 B2	2/2017	Sawa
8,395,653 B2	3/2013	Feng	9,591,404 B1	3/2017	Chhetri
8,403,107 B2	3/2013	Stewart, Jr. et al.	D784,299 S *	4/2017	Cho
8,433,061 B2	4/2013	Cutler	9,615,173 B2	4/2017	Sako
8,437,490 B2	5/2013	Marton	9,635,186 B2	4/2017	Pandey
8,443,930 B2	5/2013	Stewart, Jr.	D787,481 S	5/2017	Tysso
8,447,590 B2	5/2013	Ishibashi	9,641,688 B2	5/2017	Pandey
D685,346 S	7/2013	Szymanski et al.	9,641,929 B2	5/2017	Li
8,479,871 B2	7/2013	Stewart et al.	9,641,935 B1	5/2017	Ivanov
8,483,398 B2	7/2013	Fozunbal	9,761,243 B2	9/2017	Taenzer
8,498,423 B2	7/2013	Thaden	9,813,806 B2	11/2017	Graham
8,503,653 B2	8/2013	Ahuja	9,826,211 B2	11/2017	Sawa
			9,854,101 B2	12/2017	Pandey
			9,866,952 B2	1/2018	Pandey
			D811,393 S *	2/2018	Ahn ..... D14/371
			9,894,434 B2	2/2018	Rollow, IV



## US D865,723 S

Page 4

(56)	<b>References Cited</b>					
	U.S. PATENT DOCUMENTS					
	9,930,448	B1	3/2018	Chen	2010/0189275	A1 7/2010 Christoph
	D819,607	S *	6/2018	Chui ..... D14/225	2010/0202628	A1 8/2010 Meyer
	10,244,219	B2	3/2019	Sawa	2010/0215184	A1 8/2010 Buck
	D860,319	S *	9/2019	Beruto ..... D20/10	2010/0217590	A1 8/2010 Nemer
	2002/0015500	A1	2/2002	Belt	2010/0314513	A1 12/2010 Evans et al.
	2002/0041679	A1	4/2002	Beaucoup	2011/0007921	A1 1/2011 Stewart, Jr. et al.
	2002/0131580	A1	9/2002	Smith	2011/0038229	A1 2/2011 Beaucoup
	2002/0149070	A1	10/2002	Sheplak et al.	2011/0096915	A1 4/2011 Nemer
	2003/0053639	A1	3/2003	Beaucoup	2011/0164761	A1 7/2011 McCowan
	2003/0059061	A1	3/2003	Tsuji	2011/0194719	A1 8/2011 Frater
	2003/0063762	A1	4/2003	Tajima et al.	2011/0211706	A1 9/2011 Tanaka
	2003/0107478	A1	6/2003	Hendricks	2011/0311064	A1 12/2011 Teutsch
	2003/0118200	A1	6/2003	Beaucoup	2011/0311085	A1 12/2011 Stewart, Jr. et al.
	2003/0138119	A1	7/2003	Pocino	2011/0317862	A1 12/2011 Hosoe
	2003/0161485	A1	8/2003	Smith	2012/0002835	A1 1/2012 Stewart, Jr. et al.
	2003/0185404	A1	10/2003	Milsap	2012/0027227	A1 2/2012 Kok
	2004/0013038	A1	1/2004	Kajala	2012/0076316	A1 3/2012 Zhu
	2004/0013252	A1	1/2004	Craner	2012/0080260	A1 4/2012 Stewart, Jr. et al.
	2004/0105557	A1	6/2004	Matsuo	2012/0093344	A1 4/2012 Sun
	2004/0125942	A1	7/2004	Beaucoup	2012/0128160	A1 5/2012 Kim
	2004/0240664	A1	12/2004	Freed	2012/0128175	A1 5/2012 Visser
	2005/0094580	A1	5/2005	Kumar	2012/0155688	A1 6/2012 Wilson
	2005/0094795	A1	5/2005	Rambo	2012/0169826	A1 7/2012 Jeong
	2005/0149320	A1	7/2005	Kajala	2012/0177219	A1 7/2012 Mullen et al.
	2005/0175189	A1	8/2005	Lee	2012/0182429	A1 7/2012 Forutanpour
	2005/0213747	A1	9/2005	Popovich	2012/0224709	A1 9/2012 Keddem
	2005/0271221	A1	12/2005	Cerwin	2012/0243698	A1 9/2012 Elko
	2005/0286698	A1	12/2005	Bathurst	2012/0262536	A1 10/2012 Chen
	2006/0088173	A1	4/2006	Rodman	2012/0288079	A1 11/2012 Burnett
	2006/0104458	A1	5/2006	Kenoyer	2012/0288114	A1 11/2012 Duraiswami
	2006/0151256	A1	7/2006	Lee	2012/0294472	A1 11/2012 Hudson et al.
	2006/0159293	A1	7/2006	Azima et al.	2012/0327115	A1 12/2012 Chhetri
	2006/0165242	A1	7/2006	Miki	2013/0004013	A1 1/2013 Stewart, Jr. et al.
	2006/0192976	A1	8/2006	Hall et al.	2013/0015014	A1 1/2013 Stewart, Jr. et al.
	2006/0198541	A1	9/2006	Henry	2013/0016847	A1 1/2013 Steiner
	2006/0215866	A1	9/2006	Francisco et al.	2013/0029684	A1 1/2013 Kawaguchi
	2006/0233353	A1	10/2006	Beaucoup	2013/0034241	A1 2/2013 Pandey
	2006/0239471	A1	10/2006	Mao	2013/0039504	A1 2/2013 Pandey et al.
	2006/0262942	A1	11/2006	Oxford	2013/0083911	A1 4/2013 Bathurst
	2006/0269080	A1	11/2006	Oxford	2013/0094689	A1 4/2013 Tanaka et al.
	2007/0053524	A1	3/2007	Haulick	2013/0101141	A1 4/2013 McElveen
	2007/0093714	A1	4/2007	Beaucoup	2013/0136274	A1 5/2013 Aehgren
	2007/0116255	A1	5/2007	Derkx	2013/0206501	A1 8/2013 Yu
	2007/0120029	A1	5/2007	Keung et al.	2013/0251181	A1 9/2013 Stewart, Jr. et al.
	2007/0165871	A1	7/2007	Roovers	2013/0264144	A1 10/2013 Hudson et al.
	2007/0230712	A1	10/2007	Belt	2013/0271559	A1 10/2013 Feng
	2008/0101622	A1	5/2008	Sugiyama	2013/0336516	A1 12/2013 Stewart et al.
	2008/0130907	A1	6/2008	Sudo	2013/0343549	A1 12/2013 Vemireddy
	2008/0144848	A1	6/2008	Buck	2014/0016794	A1 1/2014 Lu
	2008/0232607	A1	9/2008	Tashev	2014/0072151	A1 3/2014 Ochs
	2008/0247567	A1	10/2008	Kjolerbakken	2014/0098964	A1 4/2014 Rosca
	2008/0259731	A1	10/2008	Haponnen	2014/0233777	A1 8/2014 Tseng et al.
	2008/0260175	A1	10/2008	Elko	2014/0264654	A1 9/2014 Salmon
	2008/0285772	A1	11/2008	Haulick	2014/0265774	A1 9/2014 Stewart, Jr. et al.
	2009/0003586	A1 *	1/2009	Lai ..... H04M 9/082 379/406.01	2014/0270271	A1 9/2014 Dehe et al.
	2009/0030536	A1	1/2009	Gur	2014/0286518	A1 9/2014 Stewart, Jr. et al.
	2009/0052684	A1	2/2009	Ishibashi	2014/0301586	A1 10/2014 Stewart, Jr. et al.
	2009/0087000	A1	4/2009	Ko	2014/0307882	A1 10/2014 Leblanc
	2009/0087001	A1	4/2009	Jiang	2014/0341392	A1 11/2014 Lambert
	2009/0129609	A1 *	5/2009	Oh ..... H04R 1/406 381/92	2014/0357177	A1 12/2014 Stewart, Jr. et al.
	2009/0147967	A1	6/2009	Ishibashi	2015/0030172	A1 1/2015 Gaensler
	2009/0150149	A1	6/2009	Cutter	2015/0055796	A1 2/2015 Nugent
	2009/0169027	A1	7/2009	Ura	2015/0055797	A1 2/2015 Nguyen
	2009/0274318	A1	11/2009	Ishibashi	2015/0070188	A1 3/2015 Aramburu
	2009/0310794	A1	12/2009	Ishibashi	2015/0078581	A1 3/2015 Etter
	2010/0011644	A1	1/2010	Kramer	2015/0078582	A1 3/2015 Graham et al.
	2010/0034397	A1	2/2010	Nakadai	2015/0117672	A1 4/2015 Christoph
	2010/0074433	A1	3/2010	Zhang	2015/0118960	A1 4/2015 Petit et al.
	2010/0111324	A1	5/2010	Yeldener	2015/0126255	A1 5/2015 Yang
	2010/0119097	A1	5/2010	Ohtsuka	2015/0281832	A1 10/2015 Kishimoto
	2010/0128892	A1	5/2010	Chen	2015/0281833	A1 10/2015 Shigenaga
	2010/0131749	A1	5/2010	Kim	2015/0350621	A1 12/2015 Sawa
	2010/0150364	A1	6/2010	Buck	2016/0029120	A1 1/2016 Nesta
					2016/0031700	A1 2/2016 Sparks et al.
					2016/0080867	A1 3/2016 Nugent
					2016/0111109	A1 4/2016 Tsujikawa
					2016/0142548	A1 5/2016 Pandey
					2016/0142815	A1 5/2016 Norris
					2016/0148057	A1 5/2016 Oh

## US D865,723 S

Page 5

(56)

## References Cited

## U.S. PATENT DOCUMENTS

2016/0150316 A1 5/2016 Kubota  
 2016/0234593 A1 8/2016 Matsumoto  
 2016/0295279 A1 10/2016 Srinivasan  
 2016/0300584 A1\* 10/2016 Pandey ..... H04R 3/005  
 2016/0302002 A1\* 10/2016 Lambert ..... H04R 3/04  
 2016/0302006 A1\* 10/2016 Pandey ..... H04R 3/005  
 2016/0323668 A1 11/2016 Abraham  
 2016/0330545 A1 11/2016 McElveen  
 2016/0353200 A1 12/2016 Bigeh  
 2017/0019744 A1 1/2017 Matsumoto  
 2017/0105066 A1 4/2017 McLaughlin  
 2017/0134849 A1\* 5/2017 Pandey ..... H04R 3/005  
 2017/0134850 A1\* 5/2017 Graham ..... H04R 1/406  
 2017/0164101 A1 6/2017 Rollow, IV  
 2017/0180861 A1 6/2017 Chen  
 2017/0264999 A1 9/2017 Fukuda  
 2017/0374454 A1 12/2017 Bernardini  
 2018/0160224 A1\* 6/2018 Graham ..... H04R 3/04

## FOREIGN PATENT DOCUMENTS

CA 2846323 A1 9/2014  
 CN 102646418 8/2012  
 CN 102821336 12/2012  
 CN 102833664 A1 12/2012  
 CN 102860039 1/2013  
 CN 104080289 A1 10/2014  
 CN 104581463 4/2015  
 DE 2941485 4/1981  
 EP 0594098 4/1994  
 EP 0869697 10/1998  
 EP 1184676 3/2002  
 EP 0944228 6/2003  
 EP 1439526 7/2004  
 EP 1651001 4/2006  
 EP 1727344 11/2006  
 EP 1906707 4/2008  
 EP 1962547 8/2008  
 EP 2197219 6/2010  
 EP 2721837 A1 4/2014  
 EP 2778310 A1 9/2014  
 EP 3131311 2/2017  
 JP JPH01260967 10/1989  
 JP JPH07336790 12/1995  
 JP 3175622 6/2001  
 JP 2003087890 3/2003  
 JP 2004349806 12/2004  
 JP 2004537232 12/2004  
 JP 2005323084 11/2005  
 JP 2006094389 4/2006  
 JP 2006101499 4/2006  
 JP 4120646 8/2006  
 JP 4258472 8/2006  
 JP 4196956 9/2006  
 JP 2006340151 12/2006  
 JP 4760160 1/2007  
 JP 4752403 3/2007  
 JP 4867579 6/2007  
 JP 2007208503 8/2007  
 JP 2007228069 9/2007  
 JP 2007228070 9/2007  
 JP 2007274131 10/2007  
 JP 2007274463 10/2007  
 JP 2008005347 1/2008  
 JP 2008042754 2/2008  
 JP 2008154056 7/2008  
 JP 2008259022 10/2008  
 JP 2008312002 12/2008  
 JP 2009206671 9/2009  
 JP 2010114554 5/2010  
 JP 2010268129 11/2010  
 JP 2011015018 1/2011  
 KR 100960781 1/2004  
 KR 300856915 \* 5/2016  
 KR 300888582 \* 12/2016

WO WO 2006049260 5/2006  
 WO WO 2006071119 7/2006  
 WO WO 2010001508 1/2010  
 WO WO 2010140084 12/2010  
 WO WO 2010144148 A2 12/2010  
 WO WO 2011104501 9/2011  
 WO WO 2012160459 11/2012  
 WO WO 2012174159 A1 12/2012  
 WO WO 2016176429 11/2016

## OTHER PUBLICATIONS

Advanced Network Devices, IPSCM Ceiling Tile IP Speaker, Feb. 2011, 2 pgs.  
 Advanced Network Devices, IPSCM Standard 2' by 2' Ceiling Tile Speaker, 2 pgs.  
 Affes et al., A Signal Subspace Tracking Algorithm for Microphone Array Processing of Speech, IEEE Trans. On Speech and Audio Processing, vol. 5, No. 5, Sep. 1997, pp. 425-437.  
 Affes et al., A Source Subspace Tracking Array of Microphones for Double Talk Situations, 1996 IEEE International Conference on Acoustics, Speech, and Signal Processing Conference Proceedings, May 1996, pp. 909-912.  
 Affes et al., An Algorithm for Multisource Beamforming and Multitarget Tracking, IEEE Trans. On Signal Processing, vol. 44, No. 6, Jun. 1996, pp. 1512-1522.  
 Affes et al., Robust Adaptive Beamforming via LMS-Like Target Tracking, Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing, Apr. 1994, pp. IV-269-IV-272.  
 Armstrong World Industries, Inc., I-Ceilings Sound Systems Speaker Panels, 2002, 4 pgs.  
 Arnold et al., A Directional Acoustic Array Using Silicon Micromachined Piezoresistive Microphones, Journal of the Acoustical Society of America, 113(1), Jan. 2003, pp. 289-298.  
 Atlas Sound, I128SYSM IP Compliant Loudspeaker System with Microphone Data Sheet, 2009, 2 pgs.  
 Atlas Sound, I'X2' IP Speaker with Microphone for Suspended Ceiling Systems, <https://www.atlasied.com/i128sym>, retrieved Oct. 25, 2107, 5 pgs.  
 Audio Technica, ES945 Omnidirectional Condenser Boundary Microphones, <https://eu.audio-technica.com/resources/ES945%20Specifications.pdf>, 2007, 1 pg.  
 Audix Microphones, Audix Introduces Innovative Ceiling Mics, [http://audixusa.com/docs\\_12/latest\\_news/EFplFkAAklOtSdolke.shtml](http://audixusa.com/docs_12/latest_news/EFplFkAAklOtSdolke.shtml), Jun. 2011, 6 pgs.  
 Audix Microphones, M70 Flush Mount Ceiling Mic, May 2016, 2 pgs.  
 Beh et al., Combining Acoustic Echo Cancellation and Adaptive Beamforming for Achieving Robust Speech Interface in Mobile Robot, 2008 IEEE/RSJ International Conference on Intelligent Robots and Systems, Sep. 2008, pp. 1693-1698.  
 Benesty et al., A New Class of Doubletalk Detectors Based on Cross-Correlation, IEEE Transactions on Speech and Audio Processing, vol. 8, No. 2, Mar. 2000, pp. 168-172.  
 Benesty et al., Adaptive Algorithms for MIMO Acoustic Echo Cancellation, [https://publik.tuwien.ac.at/files/pub-et\\_9085.pdf](https://publik.tuwien.ac.at/files/pub-et_9085.pdf), 2003, pp. 1-30.  
 Benesty et al., Frequency-Domain Adaptive Filtering Revisited, Generalization to the Multi-Channel Case, and Application to Acoustic Echo Cancellation, 2000 IEEE International Conference on Acoustics, Speech, and Signal Processing Proceedings, Jun. 2000, pp. 789-792.  
 Beyer Dynamic, Classis BM 32-33-34 DE-EN-FR 2016, 1 pg.  
 Beyer Dynamic, Classis-BM-33-PZ A1, 1 pg.  
 Boyd, et al., Convex Optimization, Mar. 15, 1999, 216 pgs.  
 Brandstein et al., Eds., Microphone Arrays: Signal Processing Techniques and Applications, Digital Signal Processing, Springer-Verlag Berlin Heidelberg, 2001, 401 pgs.  
 Bruel & Kjaer, by J.J. Christensen and J. Hald, Technical Review: Beamforming, No. 1, 2004, 54 pgs.  
 BSS Audio, Soundweb London Application Guides, 2010, 120 pgs.

## US D865,723 S

Page 6

(56)

## References Cited

## OTHER PUBLICATIONS

- Buchner et al., An Acoustic Human-Machine Interface with Multi-Channel Sound Reproduction, IEEE Fourth Workshop on Multimedia Signal Processing, Oct. 2001, pp. 359-364.
- Buchner et al., An Efficient Combination of Multi-Channel Acoustic Echo Cancellation with a Beamforming Microphone Array, International Workshop on Hands-Free Speech Communication (HSC2001), Apr. 2001, pp. 55-58.
- Buchner et al., Full-Duplex Communication Systems Using Loudspeaker Arrays and Microphone Arrays, IEEE International Conference on Multimedia and Expo, Aug. 2002, pp. 509-512.
- Buchner et al., Generalized Multichannel Frequency-Domain Adaptive Filtering: Efficient Realization and Application to Hands-Free Speech Communication, Signal Processing 85, 2005, pp. 549-570.
- Buchner et al., Multichannel Frequency-Domain Adaptive Filtering with Application to Multichannel Acoustic Echo Cancellation, Adaptive Signal Processing, 2003, pp. 95-128.
- Buchner, Multichannel Acoustic Echo Cancellation, <http://www.buchner-net.com/mcaec.html>, Jun. 2011.
- Buck, Aspects of First-Order Differential Microphone Arrays in the Presence of Sensor Imperfections, Transactions on Emerging Telecommunications Technologies, vol. 13, No. 2, Mar.-Apr. 2002, pp. 115-122.
- Buck, et al., Self-Calibrating Microphone Arrays for Speech Signal Acquisition: A Systematic Approach, Signal Processing, vol. 86, 2006, pp. 1230-1238.
- Burton et al., A New Structure for Combining Echo Cancellation and Beamforming in Changing Acoustical Environments, IEEE International Conference on Acoustics, Speech and Signal Processing, 2007, pp. 1-77-1-80.
- Campbell, Adaptive Beamforming Using a Microphone Array for Hands-Free Telephony, Virginia Polytechnic Institute and State University, Feb. 1999, 154 pgs.
- Chan et al., Uniform Concentric Circular Arrays with Frequency-Invariant Characteristics—Theory, Design, Adaptive Beamforming and DOA Estimation, IEEE Transactions on Signal Processing, vol. 55, No. 1, Jan. 2007, pp. 165-177.
- Chen et al., Design of Robust Broadband Beamformers with Passband Shaping Characteristics using Tikhonov Regularization, IEEE Transactions on Audio, Speech, and Language Processing, vol. 17, No. 4, May 2009, pp. 565-681.
- Chen, et al., A General Approach to the Design and Implementation of Linear Differential Microphone Arrays, Asia-Pacific Signal and Information Processing Association Annual Summit and Conference, 2013, 7 pgs.
- Chou, "Frequency-Independent Beamformer with Low Response Error," 1995 International Conference on Acoustics, Speech, and Signal Processing, pp. 2995-2998, May 9, 1995, 4 pp.
- Chu, Desktop Mic Array for Teleconferencing, 1995 International Conference on Acoustics, Speech, and Signal Processing, May 1995, pp. 2999-3002.
- ClearOne Communications, XAP Audio Conferencing White Paper, Aug. 2002, 78 pgs.
- ClearOne, Beamforming Microphone Array, Mar. 2012, 6 pgs.
- ClearOne, Ceiling Microphone Array Installation Manual, Jan. 9, 2012, 20 pgs.
- Cook, et al., An Alternative Approach to Interpolated Array Processing for Uniform Circular Arrays, Asia-Pacific Conference on Circuits and Systems, 2002, pp. 411-414.
- Cox et al., Robust Adaptive Beamforming, IEEE Trans. Acoust., Speech, and Signal Processing, vol. ASSP-35, No. 10, Oct. 1987, pp. 1365-1376.
- CTG Audio, Ceiling Microphone CTG CM-01, Jun. 5, 2008, 2 pgs.
- CTG Audio, CM-01 & CM-02 Ceiling Microphones Specifications, 2 pgs.
- CTG Audio, CM-01 & CM-02 Ceiling Microphones, 2017, 4 pgs.
- CTG Audio, Expand Your IP Teleconferencing to Full Room Audio, <http://www.ctgaudio.com/expand-your-ip-teleconferencing-to-full-room-audio-while-conquering-echo-cancellation-issues.html>, Jul. 29, 2014, 3 pgs.
- CTG Audio, Installation Manual, Nov. 21, 2008, 25 pgs.
- CTG Audio, White on White—Introducing the CM-02 Ceiling Microphone, <https://ctgaudio.com/white-on-white-introducing-the-cm-02-ceiling-microphone/>, Feb. 20, 2014, 3 pgs.
- Dahl et al., Acoustic Echo Cancelling with Microphone Arrays, Research Report 3/95, Univ. of Karlskrona/Ronneby, Apr. 1995, 64 pgs.
- Desiraju et al., Efficient Multi-Channel Acoustic Echo Cancellation Using Constrained Sparse Filter Updates in the Subband Domain, ITG-Fachbericht 252: Speech Communication, Sep. 2014, 4 pgs.
- DiBiase et al., Robust Localization in Reverberent Rooms, in Brandstein, ed., Microphone Arrays: Techniques and Applications, 2001, Springer-Verlag Berlin Heidelberg, pp. 157-180.
- Do et al., a Real-Time SRP-PHAT Source Location Implementation using Stochastic Region Contraction (SRC) on a Large-Aperture Microphone Array, 2007 IEEE International Conference on Acoustics, Speech and Signal Processing—ICASSP '07, Apr. 2007, pp. 1-121-1-124.
- Fan et al., Localization Estimation of Sound Source by Microphones Array, Procedia Engineering 7, 2010, pp. 312-317.
- Flanagan et al., Autodirective Microphone Systems, Acustica, vol. 73, 1991, pp. 58-71.
- Flanagan et al., Computer-Steered Microphone Arrays for Sound Transduction in Large Rooms, J. Acoust. Soc. Am. 78 (5), Nov. 1985, pp. 1508-1518.
- Frost, III, An Algorithm for Linearly Constrained Adaptive Array Processing, Proc. IEEE, vol. 60, No. 8, Aug. 1972, pp. 926-935.
- Gannot et al., Signal Enhancement using Beamforming and Nonstationarity with Applications to Speech, IEEE Trans. On Signal Processing, vol. 49, No. 8, Aug. 2001, pp. 1614-1626.
- Gansler et al., A Double-Talk Detector Based on Coherence, IEEE Transactions on Communications, vol. 44, No. 11, Nov. 1996, pp. 1421-1427.
- Gazor et al., Robust Adaptive Beamforming via Target Tracking, IEEE Transactions on Signal Processing, vol. 44, No. 5, Jun. 1996, pp. 1589-1593.
- Gazor et al., Wideband Multi-Source Beamforming with Adaptive Array Location Calibration and Direction Finding, 1995 International Conference on Acoustics, Speech, and Signal Processing, May 1995, pp. 1904-1907.
- Gentner Communications Corp., AP400 Audio Perfect 400 Audioconferencing System Installation & Operation Manual, Nov. 1998, 80 pgs.
- Gentner Communications Corp., XAP 800 Audio Conferencing System Installation & Operation Manual, Oct. 2001, 152 pgs.
- Gil-Cacho et al., Multi-Microphone Acoustic Echo Cancellation Using Multi-Channel Warped Linear Prediction of Common Acoustical Poles, 18th European Signal Processing Conference, Aug. 2010, pp. 2121-2125.
- Gritton et al., Echo Cancellation Algorithms, IEEE ASSP Magazine, vol. 1, issue 2, Apr. 1984, pp. 30-38.
- Hamalainen et al., Acoustic Echo Cancellation for Dynamically Steered Microphone Array Systems, 2007 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, Oct. 2007, pp. 58-61.
- Herbordt, Combination of Robust Adaptive Beamforming with Acoustic Echo Cancellation for Acoustic Human/Machine Interfaces, Friedrich-Alexander University, 2003, 293 pgs.
- Herbordt et al., A Real-time Acoustic Human-Machine Front-End for Multimedia Applications Integrating Robust Adaptive Beamforming and Stereophonic Acoustic Echo Cancellation, 7th International Conference on Spoken Language Processing, Sep. 2002, 4 pgs.
- Herbordt et al., GSAEC—Acoustic Echo Cancellation embedded into the Generalized Sidelobe Canceller, 10th European Signal Processing Conference, Sep. 2000, 5 pgs.
- Herbordt et al., Joint Optimization of LCMV Beamforming and Acoustic Echo Cancellation for Automatic Speech Recognition, IEEE International Conference on Acoustics, Speech, and Signal Processing, Mar. 2005, pp. III-77-III-80.
- Herbordt et al., Multichannel Bin-Wise Robust Frequency-Domain Adaptive Filtering and Its Application to Adaptive Beamforming, IEEE Transactions on Audio, Speech, and Language Processing, vol. 15, No. 4, May 2007, pp. 1340-1351.

## US D865,723 S

Page 7

(56)

## References Cited

## OTHER PUBLICATIONS

Huang et al., Immersive Audio Schemes: The Evolution of Multi-party Teleconferencing, *IEEE Signal Processing Magazine*, Jan. 2011, pp. 20-32.

International Search Report and Written Opinion for PCT/US2016/029751 dated Nov. 28, 2016, 21 pp.

InvenSense Inc., Microphone Array Beamforming, Dec. 31, 2013, 12 pgs.

Ishii et al., Investigation on Sound Localization using Multiple Microphone Arrays, Reflection and Spatial Information, Japanese Society for Artificial Intelligence, JSAI Technical Report, SIG-Challenge-B202-11, 2012, pp. 64-69.

Ito et al., Aerodynamic/Aeroacoustic Testing in Anechoic Closed Test Sections of Low-speed Wind Tunnels, 16th AIAA/CEAS Aeroacoustics Conference, 2010, 11 pgs.

Johansson et al., Robust Acoustic Direction of Arrival Estimation using Root-SRP-PHAT, a Realtime Implementation, *IEEE International Conference on Acoustics, Speech, and Signal Processing*, Mar. 2005, 4 pgs.

Johansson, et al., Speaker Localisation using the Far-Field SRP-PHAT in Conference Telephony, 2002 International Symposium on Intelligent Signal Processing and Communication Systems, 5 pgs.

Julstrom et al., Direction-Sensitive Gating: A New Approach to Automatic Mixing, *J. Audio Eng. Soc.*, vol. 32, No. 7/8, Jul./Aug. 1984, pp. 490-506.

Kahrs, Ed., The Past, Present, and Future of Audio Signal Processing, *IEEE Signal Processing Magazine*, Sep. 1997, pp. 30-57.

Kallinger et al., Multi-Microphone Residual Echo Estimation, 2003 *IEEE International Conference on Acoustics, Speech, and Signal Processing*, Apr. 2003, 4 pgs.

Kammeyer, et al., New Aspects of Combining Echo Cancellers with Beamformers, *IEEE International Conference on Acoustics, Speech, and Signal Processing*, Mar. 2005, pp. III-137-III-140.

Kellermann, A Self-Steering Digital Microphone Array, 1991 *International Conference on Acoustics, Speech, and Signal Processing*, Apr. 1991, pp. 3581-3584.

Kellermann, Acoustic Echo Cancellation for Beamforming Microphone Arrays, in Brandstein, ed., *Microphone Arrays: Techniques and Applications*, 2001, Springer-Verlag Berlin Heidelberg, pp. 281-306.

Kellermann, Integrating Acoustic Echo Cancellation with Adaptive Beamforming Microphone Arrays, *Forum Acusticum*, Berlin, Mar. 1999, pp. 1-4.

Kellermann, Strategies for Combining Acoustic Echo Cancellation and Adaptive Beamforming Microphone Arrays, 1997 *IEEE International Conference on Acoustics, Speech, and Signal Processing*, Apr. 1997, 4 pgs.

Knapp, et al., The Generalized Correlation Method for Estimation of Time Delay, *IEEE Transactions on Acoustics, Speech, and Signal Processing*, vol. ASSP-24, No. 4, Aug. 1976, pp. 320-327.

Kobayashi et al., A Hands-Free Unit with Noise Reduction by Using Adaptive Beamformer, *IEEE Transactions on Consumer Electronics*, vol. 54, No. 1, Feb. 2008, pp. 116-122.

Kobayashi et al., A Microphone Array System with Echo Canceller, *Electronics and Communications in Japan, Part 3*, vol. 89, No. 10, Feb. 2, 2006, pp. 23-32.

Lebret, et al., Antenna Array Pattern Synthesis via Convex Optimization, *IEEE Trans. on Signal Processing*, vol. 45, No. 3, Mar. 1997, pp. 526-532.

Lectrosonics, *LecNet2 Sound System Design Guide*, Jun. 2006, 28 pgs.

Lee et al., Multichannel Teleconferencing System with Multispatial Region Acoustic Echo Cancellation, *International Workshop on Acoustic Echo and Noise Control (IWAENC2003)*, Sep. 2003, pp. 51-54.

Lindstrom et al., An Improvement of the Two-Path Algorithm Transfer Logic for Acoustic Echo Cancellation, *IEEE Transactions on Audio, Speech, and Language Processing*, vol. 15, No. 4, May 2007, pp. 1320-1326.

Liu et al., Adaptive Beamforming with Sidelobe Control: A Second-Order Cone Programming Approach, *IEEE Signal Proc. Letters*, vol. 10, No. 11, Nov. 2003, pp. 331-334.

Lobo, et al., Applications of Second-Order Cone Programming, *Linear Algebra and its Applications* 284, 1998, pp. 193-228.

Luo et al., Wideband Beamforming with Broad Nulls of Nested Array, *Third Int'l Conf. on Info. Science and Tech.*, Mar. 23-25, 2013, pp. 1645-1648.

Marquardt et al., A Natural Acoustic Front-End for Interactive TV in the EU-Project DICIT, *IEEE Pacific Rim Conference on Communications, Computers and Signal Processing*, Aug. 2009, pp. 894-899.

Martin, Small Microphone Arrays with Postfilters for Noise and Acoustic Echo Reduction, in Brandstein, ed., *Microphone Arrays: Techniques and Applications*, 2001, Springer-Verlag Berlin Heidelberg, pp. 255-279.

Maruo et al., On the Optimal Solutions of Beamformer Assisted Acoustic Echo Cancellers, *IEEE Statistical Signal Processing Workshop*, 2011, pp. 641-644.

McCowan, *Microphone Arrays: A Tutorial*, Apr. 2001, 36 pgs.

Mohammed, A New Adaptive Beamformer for Optimal Acoustic Echo and Noise Cancellation with Less Computational Load, *Canadian Conference on Electrical and Computer Engineering*, May 2008, pp. 000123-000128.

Mohammed, A New Robust Adaptive Beamformer for Enhancing Speech Corrupted with Colored Noise, *AICCSA*, Apr. 2008, pp. 508-515.

Mohammed, Real-time Implementation of an efficient RLS Algorithm based on IIR Filter for Acoustic Echo Cancellation, *AICCSA*, Apr. 2008, pp. 489-494.

Myllyla et al., Adaptive Beamforming Methods for Dynamically Steered Microphone Array Systems, 2008 *IEEE International Conference on Acoustics, Speech and Signal Processing*, Mar.-Apr. 2008, pp. 305-308.

Nguyen-Ky et al., An Improved Error Estimation Algorithm for Stereophonic Acoustic Echo Cancellation Systems, 1st *International Conference on Signal Processing and Communication Systems*, Dec. 2007, 5 pgs.

Oh et al., Hands-Free Voice Communication in an Automobile With a Microphone Array, 1992 *IEEE International Conference on Acoustics, Speech, and Signal Processing*, Mar. 1992, pp. 1-281-1-284.

Omologo, Multi-Microphone Signal Processing for Distant-Speech Interaction, *Human Activity and Vision Summer School (HAVSS)*, INRIA Sophia Antipolis, Oct. 3, 2012, 79 pgs.

Pados et al., An Iterative Algorithm for the Computation of the MVDR Filter, *IEEE Trans. On Signal Processing*, vol. 49, No. 2, Feb. 2001, pp. 290-300.

Pettersen, Broadcast Applications for Voice-Activated Microphones, db, Jul./Aug. 1985, 6 pgs.

Plascore, *PCGA-XR1 3003 Aluminum Honeycomb Data Sheet*, 2008, 2 pgs.

Polycom Inc., *Vortex EF2211/EF2210 Reference Manual*, 2003, 66 pgs.

Polycom, Inc., *Polycom SoundStructure C16, C12, C8, and SR12 Design Guide*, Nov. 2013, 743 pgs.

Polycom, Inc., *Setting Up the Polycom HDX Ceiling Microphone Array Series*, [https://support.polycom.com/content/dam/polycom-support/products/Telepresence-and-Video/HDX%20Serie5/setup-maintenance/en/hdx\\_ceiling\\_microphone\\_array\\_setting\\_up.pdf](https://support.polycom.com/content/dam/polycom-support/products/Telepresence-and-Video/HDX%20Serie5/setup-maintenance/en/hdx_ceiling_microphone_array_setting_up.pdf), 2010, 16 pgs.

Polycom, Inc., *Vortex EF2241 Reference Manual*, 2002, 68 pgs.

Powers, Proving Adaptive Directional Technology Works: A Review of Studies, *The Hearing Review*, <http://www.hearingreview.com/2004/04/proving-adaptive-directional-technology-works-a-review-of-studies/>, Apr. 2004, 8 pgs.

Rabinkin et al., Estimation of Wavefront Arrival Delay Using the Cross-Power Spectrum Phase Technique, 132nd Meeting of the Acoustical Society of America, Dec. 1996, pp. 1-10.

Rane Corp., *Halogen Acoustic Echo Cancellation Guide*, AEC Guide Version 2, Nov. 2013, 16 pgs.

Rao et al., Fast LMS/Newton Algorithms for Stereophonic Acoustic Echo Cancellation, *IEEE Transactions on Signal Processing*, vol. 57, No. 8, Aug. 2009, pp. 2919-2930.



## US D865,723 S

Page 8

(56)

## References Cited

## OTHER PUBLICATIONS

Reuven et al., Joint Acoustic Echo Cancellation and Transfer Function GSC in the Frequency Domain, 23rd IEEE Convention of Electrical and Electronics Engineers in Israel, Sep. 2004, pp. 412-415.

Reuven et al., Joint Noise Reduction and Acoustic Echo Cancellation Using the Transfer-Function Generalized Sidelobe Canceller, Speech Communication, vol. 49, 2007, pp. 623-635.

Reuven et al., Multichannel Acoustic Echo Cancellation and Noise Reduction in Reverberant Environments Using the Transfer-Function GSC, 2007 IEEE International Conference on Acoustics, Speech and Signal Processing—ICASSP 07, Apr. 2007, pp. 1-81-1-84.

Ristimäki, Distributed Microphone Array System for Two-Way Audio Communication, Helsinki Univ. of Technology, Master's Thesis, Jun. 15, 2009, 73 pgs.

Rombouts et al., An Integrated Approach to Acoustic Noise and Echo Cancellation, Signal Processing 85, 2005, pp. 849-871.

Sasaki et al., A Predefined Command Recognition System Using a Ceiling Microphone Array in Noisy Housing Environments, 2008 IEEE/RSJ International Conference on Intelligent Robots and Systems, Sep. 2008, pp. 2178-2184.

Sennheiser, New microphone solutions for ceiling and desk installation, <https://en-us.sennheiser.com/news-new-microphone-solutions-for-ceiling-and-desk-installation>, Feb. 2011, 2 pgs.

Sennheiser, TeamConnect Ceiling, <https://en-us.sennheiser.com/conference-meeting-rooms-teamconnect-ceiling>, 7 pgs.

Shure AMS Update, vol. 1, No. 1, 1983, 2 pgs.

Shure AMS Update, vol. 1, No. 2, 1983, 2 pgs.

Shure AMS Update, vol. 4, No. 4, 1997, 8 pgs.

Shure Inc., Microflex Advance, <http://www.shure.com/americas/microflex-advance>, 12 pgs.

Shure Inc., MX395 Low Profile Boundary Microphones, 2007, 2 pgs.

Shure Inc., MXA910 Ceiling Array Microphone, <http://www.shure.com/americas/products/microphones/microflex-advance/mxa910-ceiling-array-microphone>, 7 pgs.

Silverman et al., Performance of Real-Time Source-Location Estimators for a Large-Aperture Microphone Array, IEEE Transactions on Speech and Audio Processing, vol. 13, No. 4, Jul. 2005, pp. 593-606.

Sinha, Ch. 9: Noise and Echo Cancellation, in Speech Processing in Embedded Systems, Springer, 2010, pp. 127-142.

Soda et al., Introducing Multiple Microphone Arrays for Enhancing Smart Home Voice Control, The Institute of Electronics, Information and Communication Engineers, Technical Report of IEICE, Jan. 2013, 6 pgs.

Symetrix, Inc., SymNet Network Audio Solutions Brochure, 2008, 32 pgs.

Tandon et al., An Efficient, Low-Complexity, Normalized LMS Algorithm for Echo Cancellation, 2nd Annual IEEE Northeast Workshop on Circuits and Systems, Jun. 2004, pp. 161-164.

Tetelbaum et al., Design and Implementation of a Conference Phone Based on Microphone Array Technology, Proc. Global Signal Processing Conference and Expo (GSPx), Sep. 2004, 6 pgs.

Tietze et al., SoundCompass: A Distributed Mems Microphone Array-Based Sensor for Sound Source Localization, Sensors, Jan. 23, 2014, pp. 1918-1949.

TOA Corp., Ceiling Mount Microphone AN-9001 Operating Instructions, [http://www.toaelectronics.com/media/an9001\\_mt1e.pdf](http://www.toaelectronics.com/media/an9001_mt1e.pdf), 1 pg.

Van Compernelle, Switching Adaptive Filters for Enhancing Noisy and Reverberant Speech from Microphone Array Recordings, Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing, Apr. 1990, pp. 833-836.

Van Trees, Optimum Array Processing: Part IV of Detection, Estimation, and Modulation Theory, 2002, 54 pgs., pp. i-xxv, 90-95, 201-230.

Van Veen et al., Beamforming: A Versatile Approach to Spatial Filtering, IEEE ASSP Magazine, vol. 5, issue 2, Apr. 1988, pp. 4-24.

Wang et al., Combining Superdirective Beamforming and Frequency-Domain Blind Source Separation for Highly Reverberant Signals, EURASIP Journal on Audio, Speech, and Music Processing, vol. 2010, pp. 113.

Weinstein et al., LOUD: A 1020-Node Microphone Array and Acoustic Beamformer, 14th International Congress on Sound & Vibration, Jul. 2007, 8 pgs.

Wung, A System Approach to Multi-Channel Acoustic Echo Cancellation and Residual Echo Suppression for Robust Hands-Free Teleconferencing, Georgia Institute of Technology, May 2015, 167 pgs.

Yamaha Corp., MRX7-D Signal Processor Product Specifications, 2016, 12 pgs.

Yamaha Corp., PJP-100H IP Audio Conference System Owner's Manual, Sep. 2006, 59 pgs.

Yamaha Corp., PJP-EC200 Conference Echo Canceller, Oct. 2009, 2 pgs.

Yan et al., Convex Optimization Based Time-Domain Broadband Beamforming with Sidelobe Control, Journal of the Acoustical Society of America, vol. 121, No. 1, Jan. 2007, pp. 46-49.

Yensen et al., Synthetic Stereo Acoustic Echo Cancellation Structure with Microphone Array Beamforming for VOIP Conferences, 2000 IEEE International Conference on Acoustics, Speech, and Signal Processing, Jun. 2000, pp. 817-820.

Zhang et al., Multichannel Acoustic Echo Cancellation in Multi-party Spatial Audio Conferencing with Constrained Kalman Filtering, 11th International Workshop on Acoustic Echo and Noise Control, Sep. 2008, 4 pgs.

Zhang et al., Selective Frequency Invariant Uniform Circular Broadband Beamformer, EURASIP Journal on Advances in Signal Processing, vol. 2010, pp. 1-11.

Zheng et al., Experimental Evaluation of a Nested Microphone Array with Adaptive Noise Cancellers, IEEE Transactions on Instrumentation and Measurement, vol. 53, No. 3, Jun. 2004, pp. 777-786.

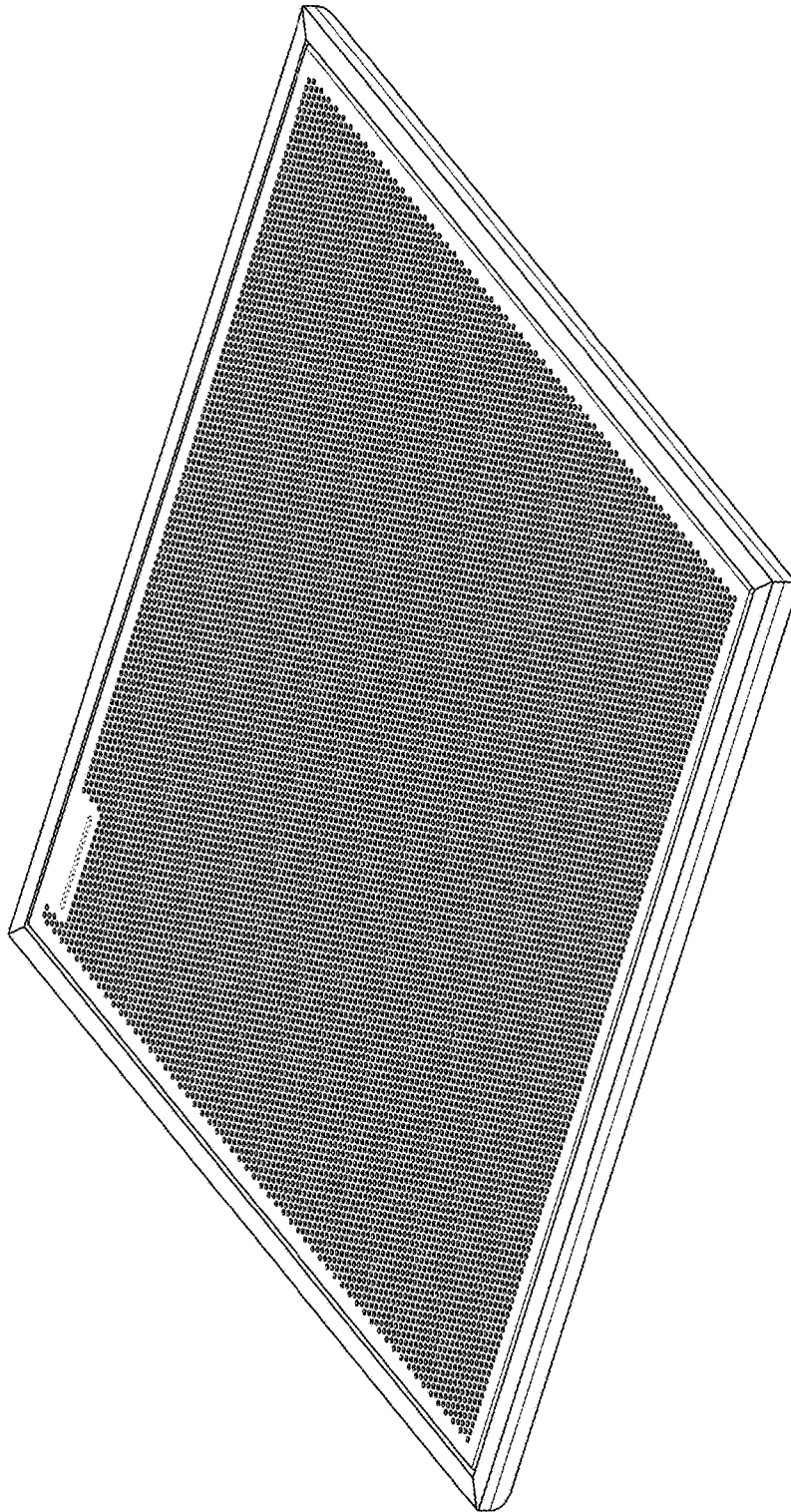
\* cited by examiner

**U.S. Patent**

**Nov. 5, 2019**

**Sheet 1 of 5**

**US D865,723 S**



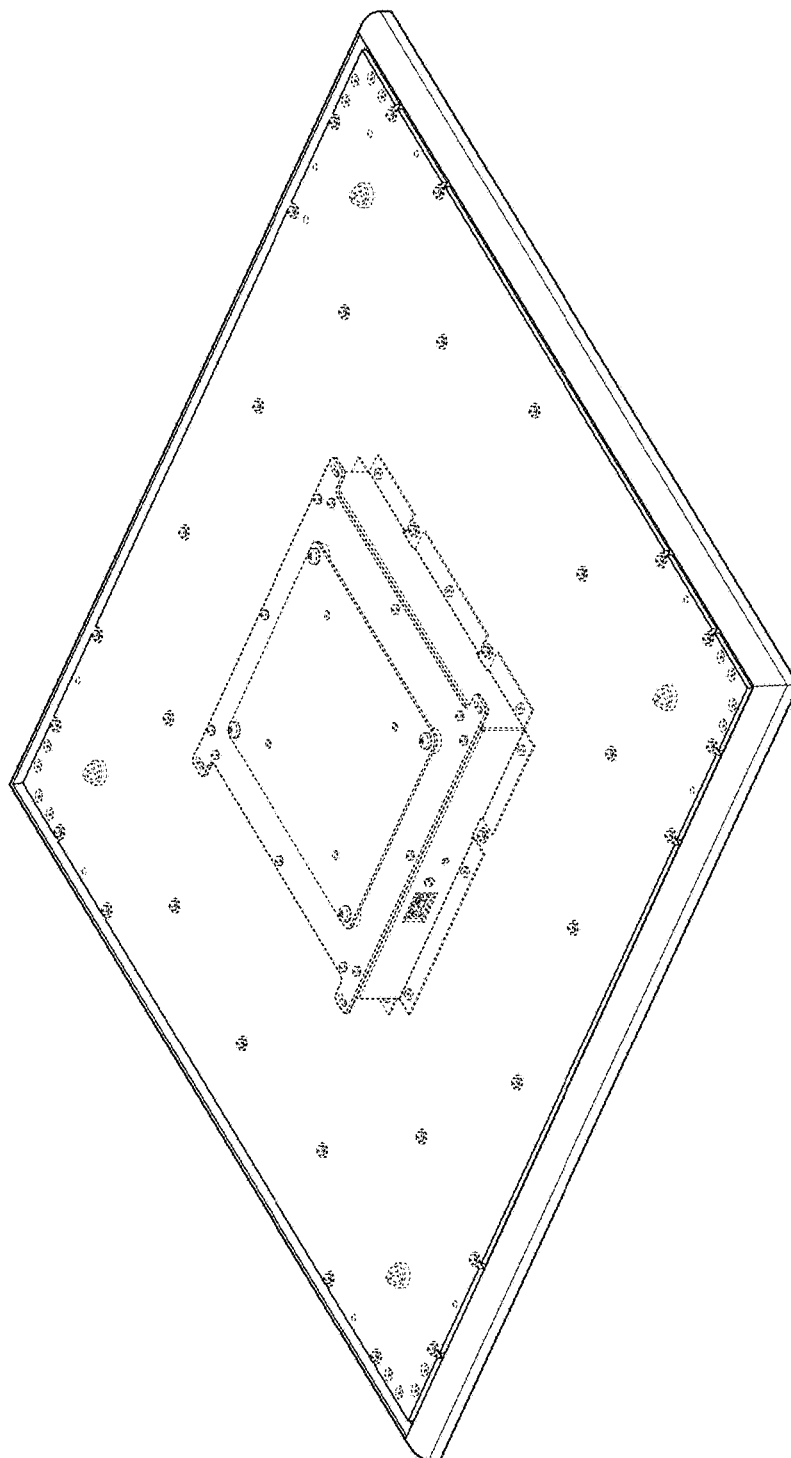
**FIG. 1**

**U.S. Patent**

**Nov. 5, 2019**

**Sheet 2 of 5**

**US D865,723 S**



**FIG. 2**



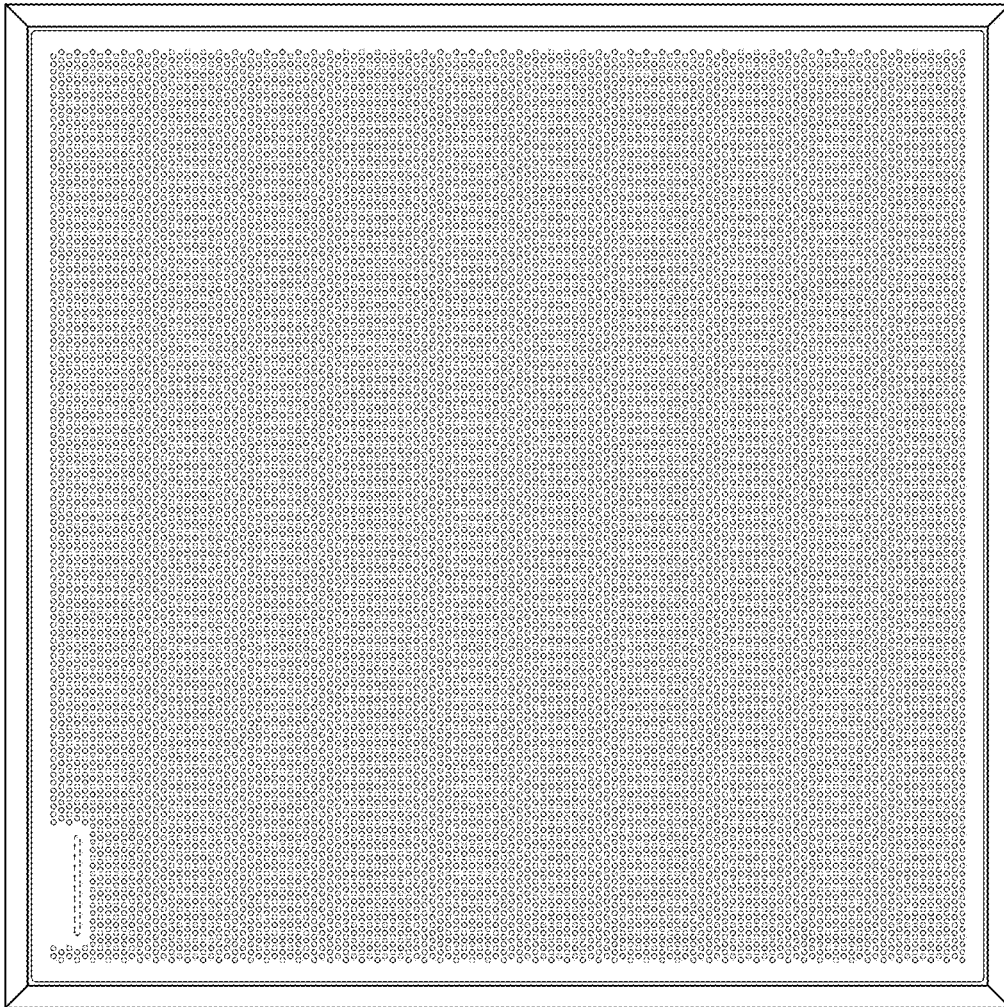
**U.S. Patent**

**Nov. 5, 2019**

**Sheet 3 of 5**

**US D865,723 S**

**FIG. 3**



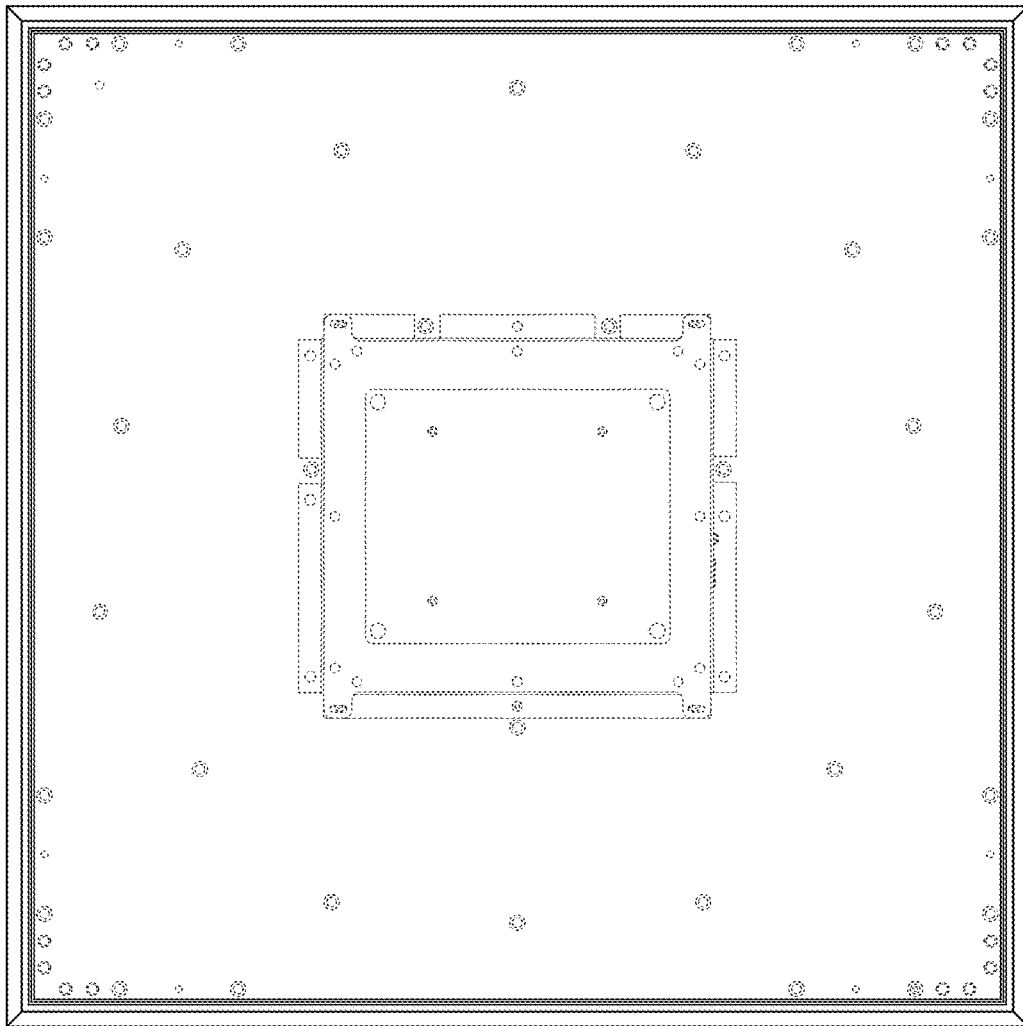
**U.S. Patent**

**Nov. 5, 2019**

**Sheet 4 of 5**

**US D865,723 S**

**FIG. 4**

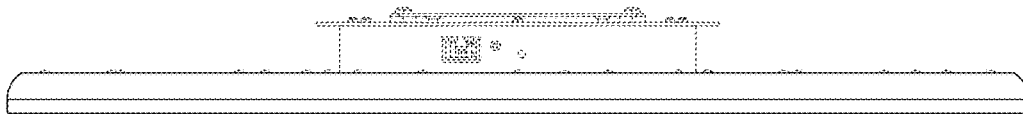


**U.S. Patent**

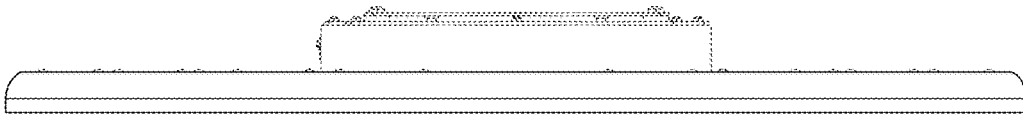
**Nov. 5, 2019**

**Sheet 5 of 5**

**US D865,723 S**



***FIG. 5***



***FIG. 6***

# EXHIBIT B

8025112

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

*November 21, 2019*

**THIS IS TO CERTIFY THAT ANNEXED IS A TRUE COPY FROM THE  
RECORDS OF THIS OFFICE OF THE FILE WRAPPER AND CONTENTS  
OF:**

**APPLICATION NUMBER: 29/700,875**

**FILING DATE: August 06, 2019**

**PATENT NUMBER: D865723**

**ISSUE DATE: November 05, 2019**



Certified by

Under Secretary of Commerce  
for Intellectual Property  
and Director of the United States  
Patent and Trademark Office



DocCode – SCORE

## **SCORE Placeholder Sheet for IFW Content**

Application Number: 29700875

Document Date: 08/06/2019

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

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At the time of document entry (noted above):

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**REQUEST FOR EXPEDITED  
EXAMINATION OF A DESIGN  
APPLICATION (37 CFR 1.155)**

Application Number	Not Yet Assigned
Filing Date	August 6, 2019
First Named Inventor	Elizabeth Ahra CHO
Title	ARRAY MICROPHONE ASSEMBLY
Atty Docket Number	15119.0002-01000

**ADDRESS TO:**

**MAIL STOP EXPEDITED DESIGN  
COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, VA 22313-1450**

**This is a request for expedited examination of a design application under 37 CFR 1.155.**

NOTE: If the Request made by this form accompanies original application papers, include form PTO/SB/18 "Design Patent Application Transmittal" or its equivalent.

A preexamination search was conducted. The field of search was:

See attached sheet.

Related applications: U.S. Application Nos. 14/701,376; 29/525,639; 15/403,765; 15/631,310; 15/833,404

If not previously filed for the above-identified application, the following items required by 37 CFR 1.155 are enclosed:

- Formal drawings (see 37 CFR 1.84).
- The fee set forth in 37 CFR 1.17(k).
- An information disclosure statement in compliance with 37 CFR 1.98.

/Elizabeth D. Ferrill/

August 6, 2019

Signature

Date

Elizabeth D. Ferrill

58,415

Typed or printed name

Registration Number, if applicable

(202) 408-4000

Telephone Number

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

This collection of information is required by 37 CFR 1.155. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ELIZABETH D. FERRILL  
(202) 408-4445  
elizabeth.ferrill@finnegan.com

August 6, 2019

ATTORNEY DOCKET NO. 15119.0002-01000

**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, VA 22313-1450**

New U.S. Design Patent Application  
For: ARRAY MICROPHONE ASSEMBLY  
Inventors: Elizabeth Ahra CHO, Gregory William LANTZ, John Matthew  
MILLER

Commissioner: This is a request for filing a

☒ Continuation ☐ Continuation-in-Part ☐ Divisional Application under 37 C.F.R.  
§ 1.53(b) of patented Prior Application No. 154/701,376 filed April 30, 2015 for ARRAY  
MICROPHONE SYSTEM AND METHOD OF ASSEMBLING THE SAME.

We enclose the following papers for filing in the U.S. Patent and Trademark  
Office in connection with the above-identified design patent application:

1. Specification containing a description of the invention and one (1) claim;
2. Drawings – Five (5) sheets of formal drawings numbered Figures 1-6;
3. Application Data Sheet;
4. Inventor Declarations;
5. An Information Disclosure Statement, SB08(1), and SB08(2);
6. Request for Expedited Examination;
7. The power of attorney is to: **FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P., Customer No. 22,852.**
8. Please address all correspondence with respect to this application to:  
**FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.,  
Customer No. 22,852.**



Commissioner of Patents  
August 6, 2019  
Page 2

9. The fee total of \$1,860.00 which represents the basic filing fee of \$200.00, search fee of \$160.00, examination fee of \$600.00, and the fee under 1.17(k) for the request for expedited examination of a design application of \$900.00.
10. The Commissioner is hereby authorized to charge any additional filing fees due and any other fees due under 37 C.F.R. § 1.17 during the pendency of this application to Deposit Account No. 06-0916.

Please accord this design patent application an application number and a filing date.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: August 6, 2019

By: /Elizabeth D. Ferrill/  
Elizabeth D. Ferrill  
Reg. No. 58,415  
(202) 408-4000

EDF/DRR  
Enclosures

DESIGN PATENT  
Customer No. 22,852  
Attorney Docket No. 15119.0002-01000

**UNITED STATES DESIGN PATENT APPLICATION**

**OF**

**ELIZABETH AHRA CHO,  
GREGORY WILLIAM LANTZ, AND  
JOHN MATTHEW MILLER**

**FOR**

**ARRAY MICROPHONE ASSEMBLY**

DESIGN PATENT  
Customer No. 22,852  
Attorney Docket No. 15119.0002-01000

Be it known that we, Elizabeth Ahra CHO, Gregory William LANTZ, and John Matthew MILLER, residents and citizens of the United States, have invented a new, original, and ornamental design for an array microphone assembly of which the following is a specification, reference being had to the accompanying drawings which form a part hereof.

Fig. 1 is a front, top, right perspective view of an array microphone assembly, showing the new design;

Fig. 2 is a rear, bottom, left perspective thereof;

Fig. 3 is a top plan view thereof;

Fig. 4 is a bottom plan view thereof;

Fig. 5 is a front view thereof; and

Fig. 6 is a left side view thereof.

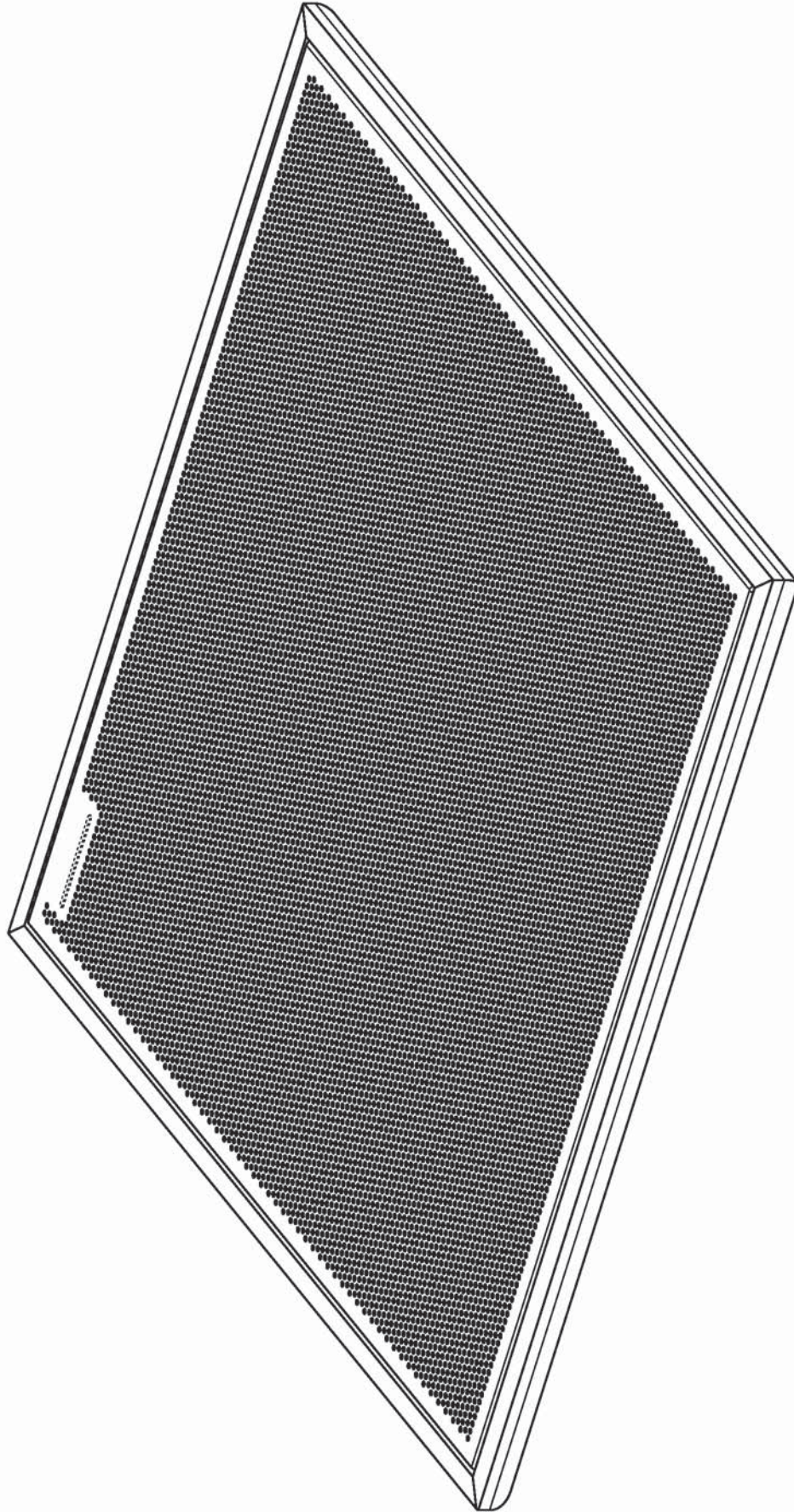
The broken lines of even length shown in the drawings illustrate portions of the array microphone assembly that form no part of the claimed design.

DESIGN PATENT  
Customer No. 22,852  
Attorney Docket No. 15119.0002-01000

**WHAT IS CLAIMED IS:**

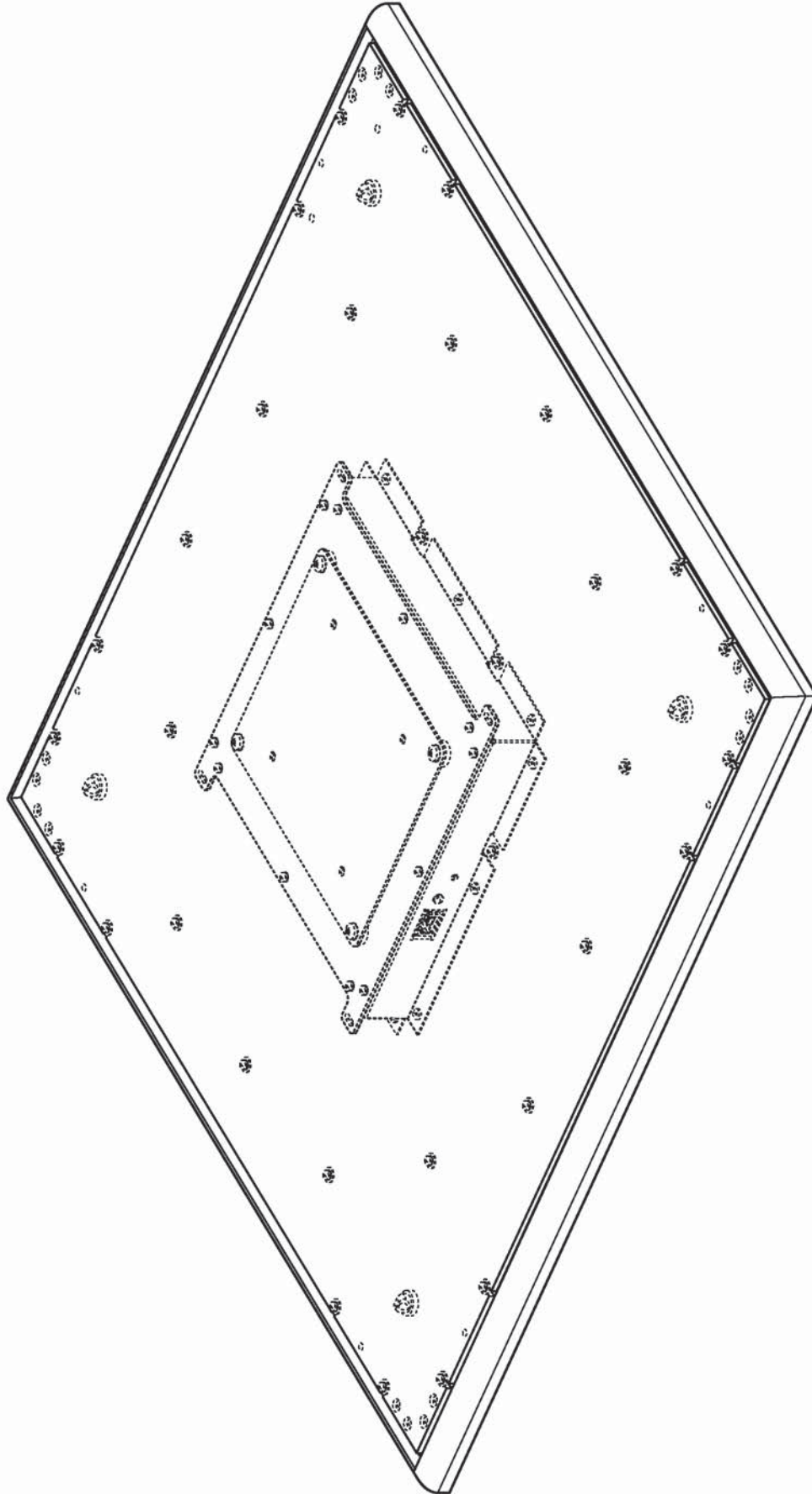
The ornamental design for an array microphone assembly, as shown and described.





**FIG. 1**





**FIG. 2**



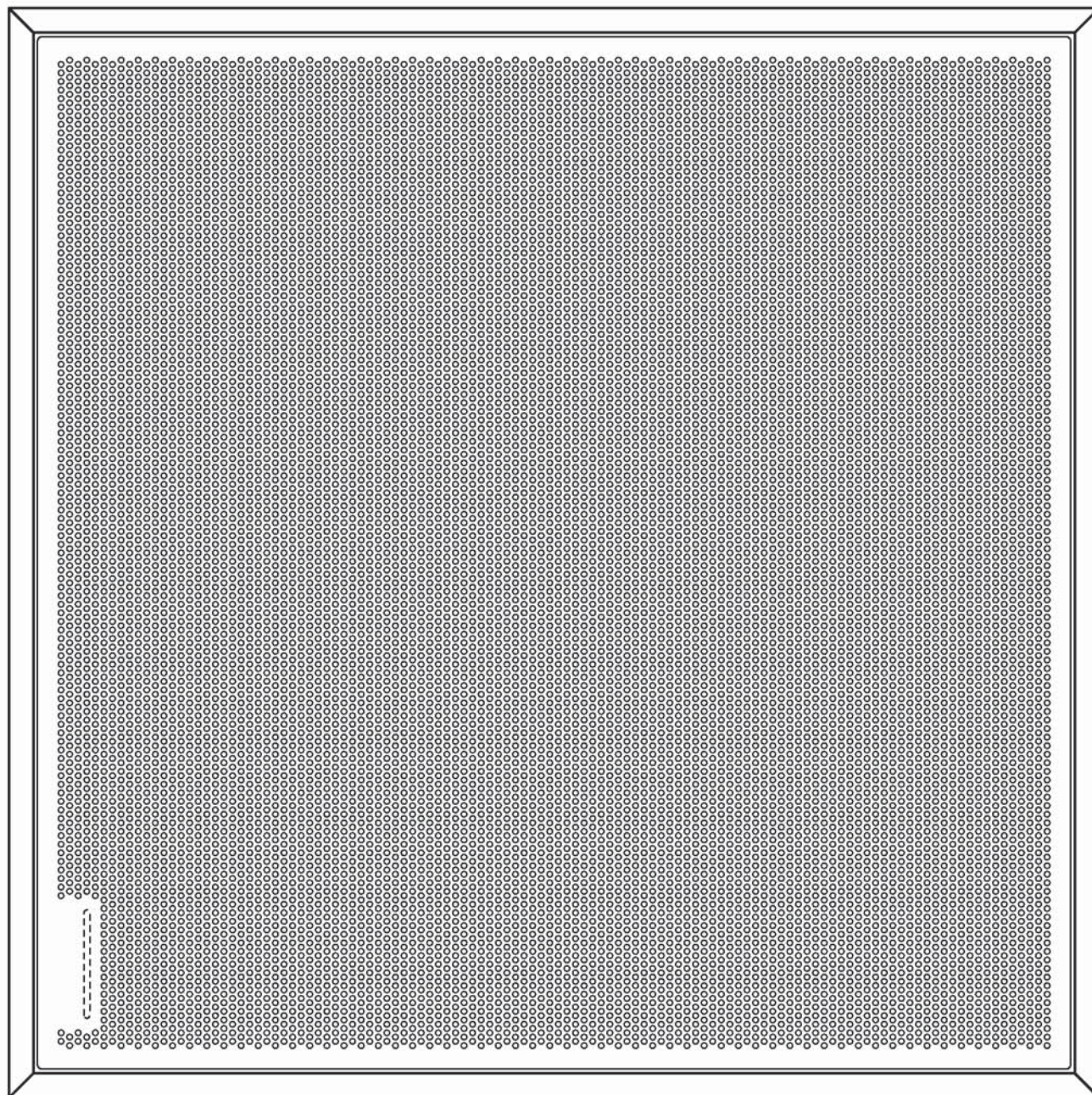
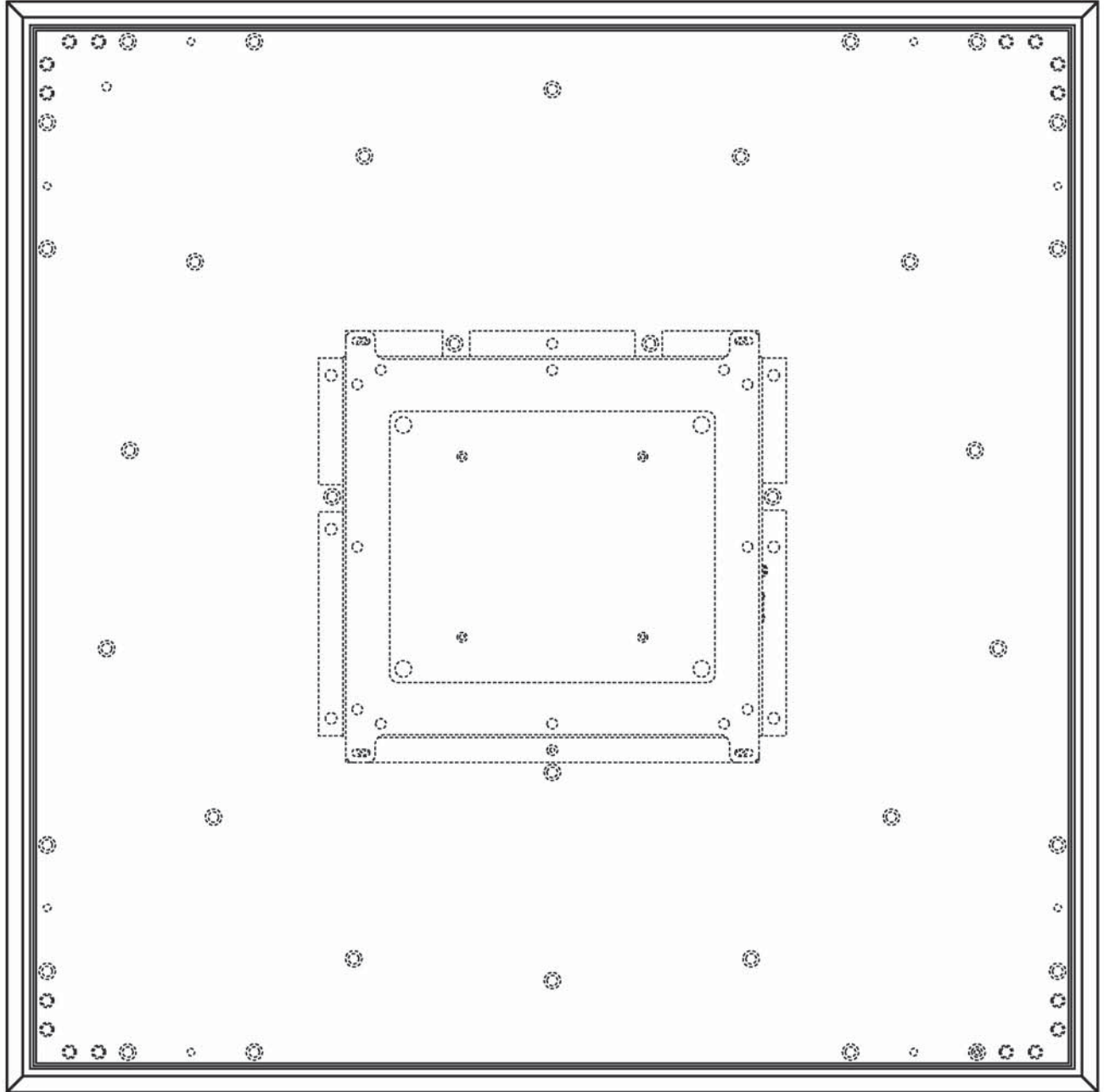
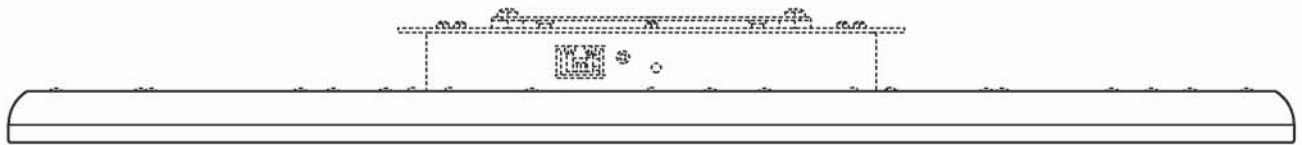


FIG. 3

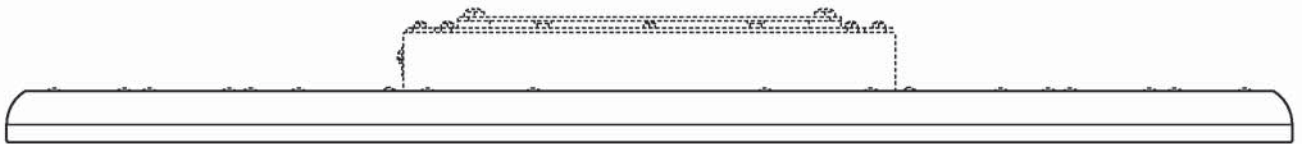


**FIG. 4**





***FIG. 5***



***FIG. 6***

**DESIGN PATENT**  
**Customer Number 22852**  
**Attorney Docket Number 15119.0002-01000**

**Request for Expedited Examination of a Design Application (37 CFR 1.155)**

**Additional Sheet**

Int. Cl:

- H04R 1/40;
- H04R 31/00;

USPC:

- D14/225, 126, 204, 214, 210, 211, 219, 221, 250, 209.1, 224, 224.1, 209;
- D23/388;
- D6/308, 300;
- 181/144, 145, 147, 148, 150, 157, 198, 199, 141, 164, 172, 173;
- 381/300, 301, 334, 364, 388, 391, 345, 395, 386;
- 257/415, 416;
- 356/505;
- 381/91, 92, 111, 174;
- 455/41.1;
- 29/594;
- 216/41;
- 310/309;
- 340/870.02;
- 347/170;
- 381/355.

CPC:

- H04R 1/02;
- H04R 25/00;
- H04R 5/02;
- H04R 1/20;
- H04R 9/06;
- H04R 1/24;
- H04R 7/18;
- H04R 1/406;
- H04R 31/00;
- H04R 2201/021;
- H04R 2201/40.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	15119.0002-01000
		Application Number	
Title of Invention	ARRAY MICROPHONE ASSEMBLY		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

**Secrecy Order 37 CFR 5.2:**

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

**Inventor Information:**

Inventor	1				<a href="#">Remove</a>	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Elizabeth	Ahra	Cho			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	Wilmette	State/Province	IL	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	1829 Wilmette Avenue					
Address 2	Unit A					
City	Wilmette	State/Province	IL			
Postal Code	60091	Country i	US			
Inventor	2				<a href="#">Remove</a>	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Gregory	William	Lantz			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	Aurora	State/Province	IL	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	664 West Galena Boulevard					
Address 2						
City	Aurora	State/Province	IL			
Postal Code	60506	Country i	US			
Inventor	3				<a href="#">Remove</a>	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	John	Matthew	Miller			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number		15119.0002-01000	
		Application Number			
Title of Invention	ARRAY MICROPHONE ASSEMBLY				
City	Grayslake	State/Province	IL	Country of Residence	US
<b>Mailing Address of Inventor:</b>					
Address 1	891 Harris Road				
Address 2					
City	Grayslake	State/Province	IL		
Postal Code	60030	Country	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button.					<input type="button" value="Add"/>

**Correspondence Information:**

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.	
Customer Number	22852
Email Address	<input type="button" value="Add Email"/> <input type="button" value="Remove Email"/>

**Application Information:**

Title of the Invention	ARRAY MICROPHONE ASSEMBLY		
Attorney Docket Number	15119.0002-01000	Small Entity Status Claimed	<input type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Design		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	1

**Filing By Reference:**

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

**Publication Information:**

<input type="checkbox"/> Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/> <b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	15119.0002-01000
		Application Number	
Title of Invention	ARRAY MICROPHONE ASSEMBLY		

**Representative Information:**

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	22852		

**Domestic Benefit/National Stage Information:**

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78. When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove			
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
	Continuation of	15/833404	2017-12-06		
Prior Application Status	Abandoned	Remove			
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
15/833404	Continuation of	15/631310	2017-06-23		
Prior Application Status	Abandoned	Remove			
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
15/63110	Continuation of	15/403765	2017-01-11		
Prior Application Status	Patented	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15/403765	Continuation of	14/701376	2015-04-30	9565493	2017-02-07
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the <b>Add</b> button.					
Add					

**Foreign Priority Information:**

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	15119.0002-01000
		Application Number	
Title of Invention	ARRAY MICROPHONE ASSEMBLY		

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)<sup>i</sup> the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country <sup>i</sup>	Filing Date (YYYY-MM-DD)	Access Code <sup>i</sup> (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

<input type="checkbox"/> This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.
---

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	15119.0002-01000
		Application Number	
Title of Invention	ARRAY MICROPHONE ASSEMBLY		

## Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

**NOTE:** This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

### 1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

**A. Priority Document Exchange (PDX)** - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

**B. Search Results from U.S. Application to EPO** - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

### 2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

**NOTE:** Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	15119.0002-01000
		Application Number	
Title of Invention	ARRAY MICROPHONE ASSEMBLY		

**Applicant Information:**

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

<b>Applicant</b>	1	<a href="#">Remove</a>
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> <p style="text-align: right;"><a href="#">Clear</a></p>		
Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
<input type="radio"/> Person to whom the inventor is obligated to assign.		<input type="radio"/> Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
Name of the Deceased or Legally Incapacitated Inventor: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>		
Organization Name	Shure Acquisition Holdings, Inc	
<b>Mailing Address Information For Applicant:</b>		
Address 1	5800 West Touhy Avenue	
Address 2		
City	Niles	State/Province
Country	US	Postal Code
Phone Number		Fax Number
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. <div style="float: right;"><a href="#">Add</a></div>		

**Assignee Information including Non-Applicant Assignee Information:**

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	15119.0002-01000
		Application Number	
Title of Invention	ARRAY MICROPHONE ASSEMBLY		

<b>Assignee</b>	1
-----------------	---

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	Given Name	Middle Name	Family Name	Suffix

**Mailing Address Information For Assignee including Non-Applicant Assignee:**

Address 1				
Address 2				
City		State/Province		
Country		Postal Code		
Phone Number		Fax Number		
Email Address				

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Add

**Signature:**

Remove

**NOTE:** This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

<b>Signature</b>	/Elizabeth D. Ferrill/		Date (YYYY-MM-DD)	2019-08-06
First Name	Elizabeth D.	Last Name	Ferrill	Registration Number
				58,415

Additional Signature may be generated within this form by selecting the Add button.

Add

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	15119.0002-01000
		Application Number	
Title of Invention	ARRAY MICROPHONE ASSEMBLY		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



# DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of  
Invention

ARRAY MICROPHONE ASSEMBLY

As the below named inventor, I hereby declare that:

This declaration  
is directed to:

☒

The attached application, or

☐

United States application or PCT international application number \_\_\_\_\_  
filed on \_\_\_\_\_.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

## WARNING:

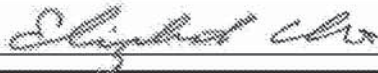
Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

## LEGAL NAME OF INVENTOR

Inventor: Elizabeth Ahra CHO

Date (Optional): 8/5/2019

Signature:



Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)****Title of  
Invention****ARRAY MICROPHONE SYSTEM AND METHOD OF ASSEMBLING THE SAME**

As the below named inventor, I hereby declare that:

This declaration  
is directed to:☐

The attached application, or

☒United States application or PCT international application number 14/701,376filed on April 30, 2015

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

**LEGAL NAME OF INVENTOR**Inventor: Gregory William Lantz

Date (Optional): \_\_\_\_\_

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-5199 and select option 2.



# DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of  
Invention

ARRAY MICROPHONE ASSEMBLY

As the below named inventor, I hereby declare that:

This declaration  
is directed to:



The attached application, or



United States application or PCT international application number \_\_\_\_\_

filed on \_\_\_\_\_.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

## WARNING:

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## LEGAL NAME OF INVENTOR

Inventor: John Matthew MILLER

Date (Optional): 8/5/2019

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



PATENT  
Attorney Docket No. 15119.0002-01000

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	)	
	)	
Elizabeth Ahra CHO	)	Group Art Unit: To be assigned
	)	
Application No.: To be assigned	)	Examiner: To be assigned
	)	
Filed: Herewith	)	
	)	
For: ARRAY MICROPHONE SYSTEM	)	Confirmation No.: To be assigned
AND METHOD OF ASSEMBLING	)	
THE SAME	)	

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Commissioner:

**INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97(b)**

Pursuant to 37 C.F.R. §§ 1.56 and 1.97(b), Applicant brings to the attention of the Examiner the documents on the attached listing. This Information Disclosure Statement is being filed concurrently with the above-referenced application. Applicant notes that this Information Disclosure Statement is being submitted in connection with a Request for Expedited Examination pursuant to 37 C.F.R. § 1.1155.

The documents listed in SB/08 (1) are of record in prior U.S. Application No. 15/833,404, filing date December 6, 2017, upon which Applicant relies for the benefits provided in 35 U.S.C. § 120, and accordingly copies are not included.

The documents listed in SB/08 (2) are newly cited. A copy of the listed non-patent literature document is included with this submission. Copies of the U.S.

Application No.: To be assigned  
Attorney Docket No.: 15119.0002-01000

patents and U.S. published patent applications are not included pursuant to 37 C.F.R.

§ 1.98(a)(2)(ii).

Applicant respectfully requests that the Examiner consider the listed documents and indicate that they were considered by making appropriate notations on the attached form.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claim in the application and Applicant determines that the cited documents do not constitute "prior art" under United States law, Applicant reserves the right to present to the U.S. Patent and Trademark Office the relevant facts and law regarding the appropriate status of such documents.

Applicant further reserves the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: August 6, 2019

By: /Elizabeth D. Ferrill/  
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				First Named Inventor	Elizabeth Ahra CHO
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U.S. PATENTS					
Examiner Initials <sup>1</sup>	Cite No. <sup>1</sup>	Document Number	Issue or Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
		US-3755625	08-28-1973	MASTON, D	
		US-3906431	09-16-1975	CLEARWATERS, WALTER L	
		US-4070547	01-24-1978	DELLAR, FRED JAY	
		US-4072821	02-07-1978	Bauer, Benjamin B.	
		US-4096353	06-20-1978	BAUER, BENJAMIN B	
		US-4131760	12-26-1978	CHRISTENSEN, SUSAN W	
		US-4184048	01-15-1980	Alcaide, Andre	
		US-4198705	04-15-1980	MASSA, FRANK	
		US-4212133	07-15-1980	Lufkin, Lindsey D.	
		US-4237339	12-02-1980	BUNTING, JOHN G	
		US-4254417	03-03-1981	SPEISER, JEFFREY M	
		US-4305141	12-08-1981	MASSA, FRANK	
		US-4308425	12-29-1981	MOMOSE, CHIKAHIDE	
		US-4311874	01-19-1982	Wallace, Jr., Robert L.	
		US-4330691	05-18-1982	Gordon, Theodore J.	
		US-4334740	06-15-1982	WRAY, WILLIAM R	
		US-4365449	12-28-1982	Liautaud, James P.	
		US-4414433	11-08-1983	HORIE, MASAO	
		US-4436966-A	03-13-1984	Botros; Radamis	
		US-4449238	05-15-1984	LEE, BYUNG H	
		US-4466117	08-14-1984	GOERIKE, RUDOLF	
		US-4485484	11-27-1984	FLANAGAN, JAMES L	
		US-4489442	12-18-1984	ANDERSON, CARL R	
		US-4521908	06-04-1985	MIYAJI	
		US-4593404	06-03-1986	Bolin, Gustav	
		US-4653102	03-24-1987	HANSEN, PER K	
		US-4658425	04-14-1987	JULSTROM	
		US-4669108	05-26-1987	DEINZER, GERALD J	
		US-4696043	09-22-1987	IWAHARA, MAKOTO	
		US-4712231	12-08-1987	Julstrom, Stephen D.	
		US-4741038	04-26-1988	ELKO, GARY W	
		US-4752961	06-21-1988	KAHN, DAVID A	
		US-4815132	03-21-1989	MINAMI, SHIGENOBU	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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				<i>Examiner Name</i>	Not Yet Assigned
Sheet	2	of	20	<i>Attorney Docket Number</i>	15119.0002-01000

U.S. PATENTS					
		US-4860366	08-22-1989	FUKUSHI, YUZO	
		US-4881135	11-14-1989	Heilweil, Jordan B.	
		US-4903247	02-20-1990	VAN GERWEN, PETRUS J	
		US-4923032	05-08-1990	Nuemberger, Mark A.	
		US-4928312	05-22-1990	Hill, Amel	
		US-5121426	06-09-1992	BAUMHAUER	
		US-5214709	05-25-1993	RIBIC, ZLATAN	
		US-5297210	03-22-1994	JULSTROM	
		US-5323459	06-21-1994	Hirano	
		US-5335011	08-02-1994	Addeo, Eric J.	
		US-5371789	12-06-1994	Hirano	
		US-5384843	01-24-1995	MASUDA, HIROYUKI	
		US-5396554	03-07-1995	Hirano	
		US-5473701	12-05-1995	CEZANNE, JUERGEN	
		US-5513265	04-30-1996	Hirano	
		US-5525765	06-11-1996	Freiheit, Ronald R.	
		US-5550924	08-27-1996	Helf, Brant M.	
		US-5574793	11-12-1996	Hirschhorn, Bruce D.	
		US-5602962	02-11-1997	Kellermann, Walter	
		US-5633936	05-27-1997	Oh, Stephen S.	
		US-5661813	08-26-1997	Shimauchi	
		US-5673327	09-30-1997	JULSTROM, STEPHEN D	
		US-5687229	11-11-1997	Sih, Gilbert C.	
		US-5706344	01-06-1998	Finn, Brian M.	
		US-5761318	06-02-1998	Shimauchi	
		US-5787183	07-28-1998	Chu, Peter Lee	
		US-5796819	08-18-1998	Romesburg, Eric Douglas	
		US-5848146	12-08-1998	Slattey, Ernest M.	
		US-5870482	02-09-1999	Loeppert et al.	
		US-5888412	03-30-1999	Sooriakumar et al.	
		US-6041127	03-21-2000	Elko, Gary Wayne	
		US-6049607	04-11-2000	Marash, Joseph	
		US-6069961-A	05-30-2000	Nakazawa; Fumihiko	
		US-6125179	09-26-2000	Wu, Ying	
		US-6137887	10-24-2000	Anderson	



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Sheet	3	of	20	<i>Attorney Docket Number</i>	15119.0002-01000

U.S. PATENTS					
		US-6173059-B1	01-09-2001	Huang, Jixiong	
		US-6205224	03-20-2001	Underbrink, James R.	
		US-6215881	04-10-2001	Azima, Henry	
		US-6329908	12-11-2001	Frecska, Sandor A.	
		US-6332029	12-18-2001	Azima, Henry Firouz	
		US-6442272	08-27-2002	Osoverts	
		US-6449593	09-10-2002	Valve, Paeivi	
		US-6488367	12-03-2002	Debesis et al.	
		US-6505057	01-07-2003	Finn, Brian M.	
		US-6556682	04-29-2003	Gilloire	
		US-6704422	03-09-2004	Jensen, Lars Baekgaard	
		US-6731334	05-04-2004	Maeng, Joonyoul	
		US-6741720	05-25-2004	Myatt, Jeffrey D.	
		US-6768795	07-27-2004	Feltstroem, Alberto Diego Jimen	
		US-6885750	04-26-2005	Egelmeers, Gerardus Paul Maria	
		US-6895093	05-17-2005	Ali	
		US-6931123	08-16-2005	Hughes	
		US-6944312	09-13-2005	Mason, John W.	
		US-6968064	11-22-2005	Ning, Aidong	
		US-6990193	01-24-2006	Beaucoup	
		US-6993126	01-31-2006	Kyrylenko, Mykola	
		US-7003099	02-21-2006	Zhang	
		US-7031269	04-18-2006	Lee, Way-Shing	
		US-7035415	04-25-2006	Belt, Harm Jan Willem	
		US-7054451	05-30-2006	Janse, Cornelis Pieter	
		US-7092516	08-15-2006	Furuta, Satoru	
		US-7092882	08-15-2006	Arrowood, Jon A.	
		US-7098865	08-29-2006	CHRISTENSEN, JACOB JUHL	
		US-7120269	10-10-2006	Lowell, Wilhelm R.	
		US-7269263	09-11-2007	Dedieu, Stephane	
		US-7359504	04-15-2008	Reuss, Edward L.	
		US-7503616	03-17-2009	Linhard, Klaus	
		US-7536769	05-26-2009	Pedersen, Michael	
		US-7660428	02-09-2010	Rodman, Jeffrey	
		US-7701110	04-20-2010	Fukuda et al.	

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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Sheet	4	of	20	<i>Attorney Docket Number</i>	15119.0002-01000

U.S. PATENTS					
		US-7724891	05-25-2010	Beaucoup, Franck	
		US-7747001	06-29-2010	Kellermann, Walter	
		US-7756278	07-13-2010	Moorer, James A.	
		US-7831035	11-09-2010	Stokes, Jack W.	
		US-7831036	11-09-2010	Beaucoup, Franck	
		US-7925006	04-12-2011	Hirai	
		US-7925007	04-12-2011	Stokes	
		US-7970123	06-28-2011	Beaucoup, Franck	
		US-7970151-B2	06-28-2011	Oxford; William V.	
		US-7991167	08-02-2011	Oxford, William V.	
		US-7995768	08-09-2011	Miki, Akira	
		US-8005238	08-23-2011	TASHEV, IVAN	
		US-8019091	09-13-2011	Burnett, Gregory C.	
		US-8085947	12-27-2011	Haulick	
		US-8098842	01-17-2012	Florencio, Dinei	
		US-8098844	01-17-2012	Elko, Gary W.	
		US-8103030	01-24-2012	Barthel, Roland	
		US-8130969	03-06-2012	Buck	
		US-8130977	03-06-2012	Chu, Peter L.	
		US-8135143	03-13-2012	Ishibashi, Toshiaki	
		US-8175291	05-08-2012	Chan, Kwok-Leung	
		US-8184801	05-22-2012	Hamalainen	
		US-8189765	05-29-2012	Nishikawa	
		US-8189810	05-29-2012	Wolff, Tobias	
		US-8199927	06-12-2012	Raftery, Emmet	
		US-8204198	06-19-2012	Adeney, Kathryn	
		US-8213596	07-03-2012	Beaucoup, Franck	
		US-8213634	07-03-2012	Daniel, Thomas Martin	
		US-8219387	07-10-2012	Cutler, Ross	
		US-8229134	07-24-2012	Duraiswami, Ramani	
		US-8233352	07-31-2012	Beaucoup, Franck	
		US-8249273	08-21-2012	Inoda, Takeshi	
		US-8275120	09-25-2012	Stokes, III, Jack W.	
		US-8284949	10-09-2012	Farhang	
		US-8286749	10-16-2012	Stewart, Jr. et al.	

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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				<i>Examiner Name</i>	Not Yet Assigned
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U.S. PATENTS					
		US-8290142	10-16-2012	Lambert, David K.	
		US-8297402	10-30-2012	Stewart et al.	
		US-8331582	12-11-2012	Steele, Brenton Robert	
		US-8385557	02-26-2013	Tashev	
		US-8395653	03-12-2013	Feng, Jinwei	
		US-8403107	03-26-2013	Stewart, Jr. et al.	
		US-8433061	04-30-2013	Cutler, Ross	
		US-8437490	05-07-2013	Marton, Trygve Frederik	
		US-8443930	05-21-2013	Stewart, Jr., William Cameron	
		US-8447590	05-21-2013	Ishibashi, Toshiaki	
		US-8479871	07-09-2013	Stewart et al.	
		US-8483398	07-09-2013	Fozunbal	
		US-8498423	07-30-2013	Thaden, Rainer	
		US-8503653	08-06-2013	Ahuja, Sudhir Raman	
		US-8515089	08-20-2013	Nicholson, Guy C.	
		US-8553904	10-08-2013	Said, Amir	
		US-8583481	11-12-2013	Viveiros, Walter	
		US-8600443	12-03-2013	Kawaguchi, Hiroshi	
		US-8605890	12-10-2013	Zhang	
		US-8631897	01-21-2014	Stewart, Jr. et al.	
		US-8638951	01-28-2014	Zurek, Robert	
		US-8644477	02-04-2014	Gilbert, Mark W.	
		US-8654990	02-18-2014	Faller, Christof	
		US-8660274	02-25-2014	Wolff, Tobias	
		US-8660275	02-25-2014	Buck, Markus	
		US-8672087	03-18-2014	Stewart, Jr. et al.	
		US-8676728	03-18-2014	Velusamy, Kavitha	
		US-8744069	06-03-2014	Cutler, Ross	
		US-8811601	08-19-2014	Mohammad, Asif I.	
		US-8818002	08-26-2014	Tashev, Ivan	
		US-8842851	09-23-2014	Beaucoup, Franck	
		US-8855326	10-07-2014	Derkx, Rene Martinus Maria	
		US-8855327	10-07-2014	Tanaka, Ryo	
		US-8873789	10-28-2014	Bigeh, Fred	
		US-8886343	11-11-2014	Ishibashi, Toshiaki	



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				Examiner Name	Not Yet Assigned
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U.S. PATENTS					
		US-8893849	11-25-2014	Hudson, Michael	
		US-8903106	12-02-2014	Meyer, Jens M.	
		US-8942382	01-27-2015	Elko, Gary W.	
		US-9002028	04-07-2015	Haulick, Tim	
		US-9094496	07-28-2015	Teutsch	
		US-9113247	08-18-2015	Chatlani, Navin	
		US-9126827	09-08-2015	Hsieh et al.	
		US-9129223	09-08-2015	Velusamy, Kavitha	
		US-9172345	10-27-2015	Kok, Hui Siew	
		US-9215327	12-15-2015	Bathurst	
		US-9215543	12-15-2015	Sun	
		US-9226088	12-29-2015	Pandey et al.	
		US-9237391	01-12-2016	Benesty, Jacob	
		US-9247367	01-26-2016	Nobile, Matthew A.	
		US-9253567	02-02-2016	Morcelli, Alessandro	
		US-9264553	02-16-2016	Pandey, Ashutosh	
		US-9294839	03-22-2016	Lambert, David K.	
		US-9301049	03-29-2016	Elko, Gary W.	
		US-9319532	04-19-2016	Bao	
		US-9319799	04-19-2016	Salmon et al.	
		US-9326060	04-26-2016	Nicholson, Guy C.	
		US-9338549	05-10-2016	Haulick, Tim	
		US-9357080	05-31-2016	Beaucoup	
		US-9403670	08-02-2016	Schelling et al.	
		US-9462378	10-04-2016	Kuech, Fabian	
		US-9479627	10-25-2016	Rung, Martin	
		US-9479885	10-25-2016	Ivanov, Plamen A.	
		US-9489948	11-08-2016	Chu, Wai C.	
		US-9510090	11-29-2016	Lissek, Herve	
		US-9516412	12-06-2016	Shigenaga, Shinichi	
		US-9560451	01-31-2017	Eichfeld, Jahn Dmitri	
		US-9565493	02-07-2017	Abraham, Mathew T.	
		US-9578413	02-21-2017	Sawa, Hirotaka	
		US-9591404	03-07-2017	Chhetri, Amit Singh	
		US-9615173	04-04-2017	Sako, Yoichiro	



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				Examiner Name	Not Yet Assigned
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U.S. PATENTS					
		US-9635186	04-25-2017	Pandey, Ashutosh	
		US-9641688	05-02-2017	Pandey, Ashutosh	
		US-9641929	05-02-2017	Li, Haiting	
		US-9641935	05-02-2017	Ivanov, Plamen A.	
		US-9761243	09-12-2017	Taenzer, Jon C.	
		US-9813806	11-07-2017	Graham, Derek	
		US-9826211-B2	11-21-2017	SAWA, HIROTAKA	
		US-9854101	12-26-2017	Pandey, Ashutosh	
		US-9866952	01-09-2018	Pandey, Ashutosh	
		US-9894434	02-13-2018	Rollow, IV, J. Douglas	
		US-9930448-B1	03-27-2018	Chen, Jingdong	
		US-10244219-B2	03-26-2019	Sawa, Hirotaka	
		US-D699712	02-18-2014	Boume	
		US-D784299	04-18-2017	Cho, Elizabeth Ahra	
		US-D787481	05-23-2017	Tysso, Jorunn	

U.S. PUBLISHED PATENT APPLICATIONS					
Examiner Initials <sup>1</sup>	Cite No. <sup>3</sup>	Document Number	Issue or Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>4</sup> (if known)			
		US-20020015500	02-07-2002	Belt, Harm Jan Willem	
		US-20020041679	04-11-2002	Beaucoup, Franck	
		US-20020131580	09-19-2002	Smith, Steven Shawn	
		US-20020149070	10-17-2002	Sheplak et al.	
		US-20030063762	04-03-2003	Tajima et al.	
		US-20030053639	03-20-2003	Beaucoup, Franck	
		US-20030059061	03-27-2003	Tsuji, Jungo	
		US-20030107478	06-12-2003	Hendricks, Richard S.	
		US-20030118200-A1	06-26-2003	BEAUCOUP, FRANCK	
		US-20030138119	07-24-2003	POCINO, MICHAEL A	
		US-20030161485	08-28-2003	Smith, Steven Shawn	
		US-20030185404	10-02-2003	Milsap, Jeffrey P.	
		US-20040013038	01-22-2004	Kajala, Matti	
		US-20040013252	01-22-2004	Craner, Michael L.	
		US-20040105557	06-03-2004	Matsuo, Naoshi	
		US-20040125942	07-01-2004	Beaucoup, Franck	
		US-20040240664	12-02-2004	Freed, Evan Lawrence	

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				Examiner Name	Not Yet Assigned
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U.S. PUBLISHED PATENT APPLICATIONS					
		US-20050094580	05-05-2005	Kumar, Krishna A.	
		US-20050094795	05-05-2005	Rambo, Darwin	
		US-20050149320	07-07-2005	Kajala, Matti	
		US-20050175189	08-11-2005	Lee, Yi-Bing	
		US-20050213747	09-29-2005	Popovich, Steven	
		US-20050271221	12-08-2005	Cerwin, Stephen A.	
		US-20050286698	12-29-2005	Bathurst, Tracy A.	
		US-2006/0192976	08-31-2006	Hall et al.	
		US-20060088173-A1	04-27-2006	Rodman; Jeffrey	
		US-20060104458	05-18-2006	Kenoyer, Michael L.	
		US-20060151256	07-13-2006	Lee, Jae H.	
		US-20060165242	07-27-2006	Miki, Akira	
		US-20060233353	10-19-2006	Beaucoup, Franck	
		US-20060239471	10-26-2006	Mao, Xiadong	
		US-20060262942	11-23-2006	Oxford, William V.	
		US-20060269080	11-30-2006	OXFORD, WILLIAM V	
		US-2007/0120029	05-31-2007	Keung et al.	
		US-20070053524	03-08-2007	HAULICK, TIM	
		US-20070093714	04-26-2007	Beaucoup, Franck	
		US-20070116255	05-24-2007	Derkx, Rene M. M.	
		US-20070165871	07-19-2007	Roovers, David A. C.	
		US-20070230712	10-04-2007	Belt, Harm J. W.	
		US-20080056517-A1	03-06-2008	Algazi; V. Ralph	
		US-20080101622	05-01-2008	Sugiyama, Akihiko	
		US-20080130907	06-05-2008	Sudo, Takashi	
		US-20080144848	06-19-2008	Buck, Markus	
		US-20080232607	09-25-2008	Tashev, Ivan	
		US-20080247567	10-09-2008	Kjolerbakken, Morgan	
		US-20080259731	10-23-2008	Happonen, Aki P.	
		US-20080260175	10-23-2008	Elko, Gary W.	
		US-20080285772	11-20-2008	Haulick, Tim	
		US-2009/0087001	04-02-2009	Jiang, Peigen	
		US-20090003586	01-01-2009	Lai, Shien-Neng	
		US-20090030536	01-29-2009	Gur, Arie	
		US-20090052684	02-26-2009	Ishibashi, Toshiaki	

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				<i>Application Number</i>	Not Yet Assigned
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				<i>First Named Inventor</i>	Elizabeth Ahra CHO
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				<i>Examiner Name</i>	Not Yet Assigned
Sheet	9	of	20	<i>Attorney Docket Number</i>	15119.0002-01000

U.S. PUBLISHED PATENT APPLICATIONS					
		US-20090087000	04-02-2009	Ko, Sang-Chul	
		US-20090129609-A1	05-21-2009	Oh; Kwang-cheol	
		US-20090147967	06-11-2009	Ishibashi, Toshiaki	
		US-20090150149	06-21-2009	Cutter	
		US-20090169027	07-02-2009	Ura	
		US-20090274318	11-05-2009	Ishibashi, Toshiaki	
		US-20090310794	12-17-2009	Ishibashi, Toshiaki	
		US-20100314513	12-16-2010	Evans et al.	
		US-20100034397-A1	02-11-2010	Nakadai; Kazuhiro	
		US-20100074433	03-25-2010	Zhang, Zhengyou	
		US-20100111324	05-06-2010	Yeldener, Suat	
		US-20100119097	05-13-2010	Ohtsuka, Yoshio	
		US-20100128892	05-27-2010	Chen, Shaohai	
		US-20100131749	05-27-2010	Kim, Kyung Hwa	
		US-20100150364	06-17-2010	Buck, Markus	
		US-20100189275	07-29-2010	Christoph, Markus	
		US-20100202628-A1	08-12-2010	Meyer; Jens M.	
		US-20100215184	08-26-2010	Buck, Markus	
		US-20100217590	08-26-2010	Nemer, Elias	
		US-20110007921	01-13-2011	Stewart, Jr. et al.	
		US-20110311085	12-22-2011	Stewart, Jr. et al.	
		US-20110038229	02-17-2011	Beaucoup, Franck	
		US-20110096915	04-28-2011	Nemer, Elias	
		US-20110164761	07-07-2011	McCowan, Iain Alexander	
		US-20110194719-A1	08-11-2011	FRATER, ROBERT HENRY	
		US-20110211706	09-01-2011	Tanaka, Ryo	
		US-20110311064	12-22-2011	Teutsch, Heinz	
		US-20110317862-A1	12-29-2011	Hosoe; Seiichiro	
		US-20120002835	01-05-2012	Stewart, Jr. et al.	
		US-20120080260	04-05-2012	Stewart, Jr. et al.	
		US-20120177219	07-12-2012	Mullen et al.	
		US-20120294472	11-22-2012	Hudson et al.	
		US-20120027227	02-02-2012	Kok, Hui Siew	
		US-20120076316	03-29-2012	Zhu, Manli	
		US-20120093344	04-19-2012	Sun, Haohai	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				<i>Application Number</i>	Not Yet Assigned
				<i>Filing Date</i>	Herewith
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				<i>Examiner Name</i>	Not Yet Assigned
Sheet	10	of	20	<i>Attorney Docket Number</i>	15119.0002-01000

U.S. PUBLISHED PATENT APPLICATIONS					
		US-20120128160	05-24-2012	Kim, Lae-Hoon	
		US-20120128175	05-24-2012	Visser, Erik	
		US-20120155688	06-21-2012	Wilson, Willsingh	
		US-20120169826	07-05-2012	Jeong, Jae-Hoon	
		US-20120182429	07-19-2012	Forutanpour, Babak	
		US-20120224709	09-06-2012	Keddem, Natan	
		US-20120243698	09-27-2012	Elko, Gary W.	
		US-20120262536	10-18-2012	Chen, Wei-Ge	
		US-20120288079	11-15-2012	Burnett, Gregory C.	
		US-20120288114-A1	11-15-2012	Duraiswami; Ramani	
		US-20120327115	12-27-2012	Chhetri, Amit S.	
		US-20130004013	01-03-2013	Stewart, Jr. et al.	
		US-20130015014	01-17-2013	Stewart, Jr. et al.	
		US-20130039504	02-14-2013	Pandey et al.	
		US-20130094689	04-18-2013	Tanaka et al.	
		US-20130101141	04-25-2013	McElveen	
		US-20130251181	09-26-2013	Stewart, Jr. et al.	
		US-20130264144	10-10-2013	Hudson et al.	
		US-20130336516	12-19-2013	Stewart et al.	
		US-20130016847	01-17-2013	Steiner, Arndt	
		US-20130029684	01-31-2013	Kawaguchi, Hiroshi	
		US-20130034241	02-07-2013	Pandey, Ashutosh	
		US-20130083911	04-04-2013	Bathurst, Tracy A.	
		US-20130136274	05-30-2013	Aehgren, Per	
		US-20130206501	08-15-2013	Yu, Qing Claire	
		US-20130271559	10-17-2013	Feng, Jinwei	
		US-20130343549	12-26-2013	Vemireddy, Krishna	
		US-20140264654	09-18-2014	Salmon, Jay	
		US-20140265774	09-18-2014	Stewart, Jr. et al.	
		US-20140270271	09-18-2014	Dehe et al.	
		US-20140286518	09-25-2014	Stewart, Jr. et al.	
		US-20140301586	10-09-2014	Stewart, Jr. et al.	
		US-20140357177	12-04-2014	Stewart, Jr. et al.	
		US-20140016794	01-16-2014	Lu	
		US-20140072151	03-13-2014	OCHS	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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				<i>Filing Date</i>	Herewith
				<i>First Named Inventor</i>	Elizabeth Ahra CHO
				<i>Art Unit</i>	Not Yet Assigned
				<i>Examiner Name</i>	Not Yet Assigned
Sheet	11	of	20	<i>Attorney Docket Number</i>	15119.0002-01000

U.S. PUBLISHED PATENT APPLICATIONS					
		US-20140098964	04-10-2014	Rosca, Justinian	
		US-20140307882	10-16-2014	Leblanc	
		US-20140341392	11-20-2014	Lambert, David K.	
		US-201410233777	08-21-2014	Tseng et al.	
		US-20150070188	03-12-2015	Aramburu, Jason	
		US-20150078582-A1	03-19-2015	Graham et al.	
		US-20150118960	04-30-2015	Petit et al.	
		US-20150030172	01-29-2015	Gaensler	
		US-20150055796-A1	02-26-2015	Nugent, David	
		US-20150055797	02-26-2015	Nguyen, Eric	
		US-20150078581	03-19-2015	Etter, Walter	
		US-20150078582-A1	03-19-2015	Graham, Derek	
		US-20150117672-A1	04-30-2015	CHRISTOPH, MARKUS	
		US-20150126255	05-07-2015	Yang	
		US-20150281832-A1	10-01-2015	KISHIMOTO, Michinori	
		US-20150281833-A1	10-01-2015	SHIGENAGA, Shinichi	
		US-20150350621	12-03-2015	Sawa, Hirotaka	
		US-20160031700	02-04-2016	Sparks et al.	
		US-20160029120	01-28-2016	Nesta	
		US-20160080867-A1	03-17-2016	Nugent, David	
		US-20160111109	04-21-2016	Tsujikawa, Masanori	
		US-20160142548	05-19-2016	Pandey, Ashutosh	
		US-20160142815	05-19-2016	Norris, John	
		US-20160148057-A1	05-26-2016	OH; Jaeyoon	
		US-20160150316	2016-05-26	Kubota, Hiroshi	
		US-20160234593-A1	08-11-2016	MATSUMOTO; Hiroyuki	
		US-20160295279	10-06-2016	Srinivasan, Venugopal	
		US-20160300584	10-13-2016	Pandey, Ashutosh	
		US-20160302002	10-13-2016	Lambert, David K.	
		US-20160302006	10-13-2016	Pandey, Ashutosh	
		US-20160323668-A1	11-03-2016	Abraham; Mathew	
		US-20160330545-A1	11-10-2016	McElveen; James Keith	
		US-20160337523	11-17-2016	Pandey, Ashutosh	
		US-20160353200	12-01-2016	Bigeh, Fred	
		US-20170019744-A1	01-19-2017	Matsumoto, Hiroyuki	

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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				Filing Date	Herewith
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				Examiner Name	Not Yet Assigned
Sheet	12	of	20	Attorney Docket Number	15119.0002-01000

U.S. PUBLISHED PATENT APPLICATIONS					
		US-20170105066	04-13-2017	McLaughlin, Hugh Joseph	
		US-20170134849	05-11-2017	Pandey, Ashutosh	
		US-20170134850	05-11-2017	Graham, Derek L.	
		US-20170164101-A1	06-08-2017	Rollow, IV; J. Douglas	
		US-20170180861-A1	06-22-2017	Chen, Hanchi	
		US-20170264999-A1	09-14-2017	FUKUDA, Teppei	
		US-20170374454-A1	12-28-2017	Bernardini; Alberto	
		US-20180160224	06-07-2018	Graham, Derek L.	

**Note: Submission of copies of U.S. Patents and published U.S. Patent Applications is not required.**

FOREIGN PATENT DOCUMENTS						
Examiner Initials <sup>7</sup>	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	Translation <sup>8</sup>
		Country Code <sup>6</sup> Number <sup>6</sup> Kind Code <sup>7</sup> (if known)				
		CA 2505496	10-27-2006	UNIV SHERBROOKE		
		CA 2838856 A1	12-20-2012	RGB Systems Inc.		
		CA 2846323 A1	09-14-2014	RGB SYSTEMS INC		
		CN 102646418	08-22-2012	BEIJING POWERCOM TECHNOLOGIES CO LTD		
		CN 102821336	12-12-2012	EGO AUDIO SHANGHAI CO LTD		
		CN 102833664 A1	12-19-2012	RGB SYSTEMS INC		
		CN 102860039	01-02-2013	FRATER ROBERT HENRY		
		CN 104080289 A1	10-01-2014	RGB SYSTEMS INC		
		CN 104581463	04-29-2015	HARMAN BECKER AUTOMOTIVE SYS		
		DE 2941485	04-23-1981	HASENAECKER HANS JOSEF		
		EP 0594098	04-27-1994	IST TRENTINO DI CULTURA		
		EP 0869697	10-07-1998	LUCENT TECHNOLOGIES INC		
		EP 1184676	03-06-2002	NOKIA MOBILE PHONES LTD		
		EP 0944228	06-04-2003	NIPPON TELEGRAPH & TELEPHONE		
		EP 1439526	07-21-2004	SAMSUNG ELECTRONICS CO LTD		
		EP 1651001	04-26-2006	POLYCOM INC		
		EP 1727344	11-29-2006	BROADCOM CORP		
		EP 1906707	04-02-2008	YAMAHA CORP		
		EP 1962547	08-27-2008	YAMAHA CORP		
		EP 2197219	06-16-2010	HARMAN BECKER AUTOMOTIVE SYS		

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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				Examiner Name	Not Yet Assigned
Sheet	13	of	20	Attorney Docket Number	15119.0002-01000

FOREIGN PATENT DOCUMENTS						
		EP 2360940	08-24-2011	TELEVIC NV		
		EP 2721837 A1	04-23-2014	RGB Systems Inc.		
		EP 2778310 A1	09-17-2014	RGB SYSTEMS INC		
		EP 3131311	02-15-2017	NOKIA TECHNOLOGIES OY		
		JP JPH01260967	10-18-1989	NEC CORP		
		JP JPH07336790	12-22-1995	NEC CORP		
		JP 3175622	06-11-2001	YAMAHA CORP		
		JP 2003087890	03-20-2003	SONY CORP		
		JP 2004349806	12-09-2004	NIPPON TELEGRAPH & TELEPHONE		
		JP 2004537232	12-09-2004	KONINKL PHILIPS ELECTRONICS NV		
		JP 2005323084	11-17-2005	NIPPON TELEGRAPH & TELEPHONE		
		JP 2006094389	04-06-2006	YAMAHA CORP		
		JP 2006101499	04-13-2006	HARMAN BECKER AUTOMOTIVE SYS		
		JP 4120646	08-10-2006	YAMAHA CORP		
		JP 4196956	09-07-2006	YAMAHA CORP		
		JP 4258472	08-10-2006	YAMAHA CORP		
		JP 2006340151	12-14-2006	MATSUSHITA ELECTRIC IND CO LTD		
		JP 4752403	03-22-2007	YAMAHA CORP		
		JP 4760160	01-18-2007	YAMAHA CORP		
		JP 4867579	06-14-2007	YAMAHA CORP		
		JP 2007208503	08-16-2007	YAMAHA CORP		
		JP 2007228069	09-06-2007	YAMAHA CORP		
		JP 2007228070	09-06-2007	YAMAHA CORP		
		JP 2007274131	10-18-2007	YAMAHA CORP		
		JP 2007274463	10-18-2007	YAMAHA CORP		
		JP 2008005347	01-10-2008	YAMAHA CORP		
		JP 2008042754	02-21-2008	YAMAHA CORP		
		JP 5028944	05-01-2008	YAMAHA CORP		
		JP 2008154056	07-03-2008	YAMAHA CORP		
		JP 2008259022	10-23-2008	YAMAHA CORP		
		JP 2008312002	12-25-2008	YAMAHA CORP		
		JP 2009206671	09-10-2009	YAMAHA CORP		
		JP 2010028653	02-04-2010	NIPPON TELEGRAPH & TELEPHONE		



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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				Examiner Name	Not Yet Assigned
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FOREIGN PATENT DOCUMENTS						
		JP 2010114554	05-20-2010	YAMAHA CORP		
		JP 2010268129	11-25-2010	OKI ELECTRIC IND CO LTD		
		JP 2011015018	01-20-2011	CLARION CO LTD		
		KR 100960781	01-07-2004	MICROSOFT CORP		
		WO 2006049260	05-11-2006	NEC CORP		
		WO 2006071119	07-06-2006	TANDBERG TELECOM AS		
		WO 2006121896	11-16-2006	SONY COMPUTER ENTERTAINMENT INC		
		WO 2010001508	01-07-2010	PANASONIC CORP		
		WO 2010140084	12-09-2010	KONINKL PHILIPS ELECTRONICS NV		
		WO 2010144148 A2	12-16-2010	RGB Systems Inc.		
		WO 2011104501	09-01-2011	BERRY MICHAEL TREVOR		
		WO 2012174159 A1	12-20-2012	RGB SYSTEMS INC		
		WO 2012160459	11-29-2012	KONINKL PHILIPS ELECTRONICS NV		
		WO 2016176429	11-03-2016	SHURE ACQUISITION HOLDINGS INC		

NONPATENT LITERATURE DOCUMENTS				
Examiner Initials <sup>*</sup>	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		Translation <sup>6</sup>
		Advanced Network Devices, IPSCM Ceiling Tile IP Speaker, Feb. 2011, 2 pgs.		
		Advanced Network Devices, IPSCM Standard 2' by 2' Ceiling Tile Speaker, 2 pgs.		
		Affes et al., A Signal Subspace Tracking Algorithm for Microphone Array Processing of Speech, IEEE Trans. On Speech and Audio Processing, Vol. 5, No. 5, Sept. 1997, pp. 425-437.		
		Affes et al., A Source Subspace Tracking Array of Microphones for Double Talk Situations, 1996 IEEE International Conference on Acoustics, Speech, and Signal Processing Conference Proceedings, May 1996, pp. 909-912.		
		Affes et al., An Algorithm for Multisource Beamforming and Multitarget Tracking, IEEE Trans. On Signal Processing, Vol. 44, No. 6, June 1996, pp. 1512-1522.		
		Affes et al., Robust Adaptive Beamforming via LMS-Like Target Tracking, Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing, Apr. 1994, pp. IV-269-IV-272.		
		Armstrong World Industries, Inc., I-Ceilings Sound Systems Speaker Panels, 2002, 4 pgs.		
		Arnold et al., A Directional Acoustic Array Using Silicon Micromachined Piezoresistive Microphones, Journal of the Acoustical Society of America, 113(1), Jan. 2003, pp. 289-298.		
		Atlas Sound, I128SYSM IP Compliant Loudspeaker System with Microphone Data Sheet, 2009, 2 pgs.		
		Atlas Sound, 1'X2' IP Speaker with Microphone for Suspended Ceiling Systems, <a href="https://www.atlasied.com/i128sysm">https://www.atlasied.com/i128sysm</a> , retrieved Oct. 25, 2017, 5 pgs.		
		Audio Technica, ES945 Omnidirectional Condenser Boundary Microphones, <a href="https://eu.audio-technica.com/resources/ES945%20Specifications.pdf">https://eu.audio-technica.com/resources/ES945%20Specifications.pdf</a> , 2007, 1 pg.		
		Audix Microphones, Audix Introduces Innovative Ceiling Mics, <a href="http://audixusa.com/docs_12/latest_news/EFpIFkAAkOtSdolke.shtml">http://audixusa.com/docs_12/latest_news/EFpIFkAAkOtSdolke.shtml</a> , June 2011, 6 pgs.		
		Audix Microphones, M70 Flush Mount Ceiling Mic, May 2016, 2 pgs.		



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	Not Yet Assigned
				Filing Date	Herewith
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				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	15	of	20	Attorney Docket Number	15119.0002-01000

NONPATENT LITERATURE DOCUMENTS			
		Beh et al., Combining Acoustic Echo Cancellation and Adaptive Beamforming for Achieving Robust Speech Interface in Mobile Robot, 2008 IEEE/RSJ International Conference on Intelligent Robots and Systems, Sept. 2008, pp. 1693-1698.	
		Benesty et al., A New Class of Doubletalk Detectors Based on Cross-Correlation, IEEE Transactions on Speech and Audio Processing, vol. 8, no. 2, March 2000, pp. 168-172.	
		Benesty et al., Adaptive Algorithms for MIMO Acoustic Echo Cancellation, <a href="https://publik.tuwien.ac.at/files/pub-et_9085.pdf">https://publik.tuwien.ac.at/files/pub-et_9085.pdf</a> , 2003, pp. 1-30.	
		Benesty et al., Frequency-Domain Adaptive Filtering Revisited, Generalization to the Multi-Channel Case, and Application to Acoustic Echo Cancellation, 2000 IEEE International Conference on Acoustics, Speech, and Signal Processing Proceedings, June 2000, pp. 789-792.	
		Beyer Dynamic, Classis BM 32-33-34 DE-EN-FR 2016, 1 pg.	
		Beyer Dynamic, Classis-BM-33-PZ A1, 1 pg.	
		Boyd, et al., Convex Optimization, March 15, 1999, 216 pgs.	
		Brandstein et al., Eds., Microphone Arrays: Signal Processing Techniques and Applications, Digital Signal Processing, Springer-Verlag Berlin Heidelberg, 2001, 401 pgs.	
		Brueel & Kjaer, by J.J. Christensen and J. Hald, Technical Review: Beamforming, No. 1, 2004, 54 pgs.	
		BSS Audio, Soundweb London Application Guides, 2010, 120 pgs.	
		Buchner et al., An Acoustic Human-Machine Interface with Multi-Channel Sound Reproduction, IEEE Fourth Workshop on Multimedia Signal Processing, Oct. 2001, pp. 359-364.	
		Buchner et al., An Efficient Combination of Multi-Channel Acoustic Echo Cancellation with a Beamforming Microphone Array, International Workshop on Hands-Free Speech Communication (HSC2001), April 2001, pp. 55-58.	
		Buchner et al., Full-Duplex Communication Systems Using Loudspeaker Arrays and Microphone Arrays, IEEE International Conference on Multimedia and Expo, Aug. 2002, pp. 509-512.	
		Buchner et al., Generalized Multichannel Frequency-Domain Adaptive Filtering: Efficient Realization and Application to Hands-Free Speech Communication, Signal Processing 85, 2005, pp. 549-570.	
		Buchner et al., Multichannel Frequency-Domain Adaptive Filtering with Application to Multichannel Acoustic Echo Cancellation, Adaptive Signal Processing, 2003, pp. 95-128.	
		Buchner, Multichannel Acoustic Echo Cancellation, <a href="http://www.buchner-net.com/mcaec.html">http://www.buchner-net.com/mcaec.html</a> , June 2011.	
		Buck, Aspects of First-Order Differential Microphone Arrays in the Presence of Sensor Imperfections, Transactions on Emerging Telecommunications Technologies, vol. 13, no. 2, Mar.-Apr. 2002, pp. 115-122.	
		Buck, et al., Self-Calibrating Microphone Arrays for Speech Signal Acquisition: A Systematic Approach, Signal Processing, vol. 86, 2006, pp. 1230-1238.	
		Burton et al., A New Structure for Combining Echo Cancellation and Beamforming in Changing Acoustical Environments, IEEE International Conference on Acoustics, Speech and Signal Processing, 2007, pp. 1-77 - 1-80.	
		Campbell, Adaptive Beamforming Using a Microphone Array for Hands-Free Telephony, Virginia Polytechnic Institute and State University, Feb. 1999, 154 pgs.	
		Chan et al., Uniform Concentric Circular Arrays with Frequency-Invariant Characteristics—Theory, Design, Adaptive Beamforming and DOA Estimation, IEEE Transactions on Signal Processing, Vol. 55, No. 1, Jan. 2007, pp. 165-177.	
		Chen et al., Design of Robust Broadband Beamformers with Passband Shaping Characteristics using Tikhonov Regularization, IEEE Transactions on Audio, Speech, and Language Processing, vol. 17, no. 4, May 2009, pp. 565-681.	
		Chen, et al., A General Approach to the Design and Implementation of Linear Differential Microphone Arrays, Asia-Pacific Signal and Information Processing Association Annual Summit and Conference, 2013, 7 pgs.	
		Chou, "Frequency-Independent Beamformer with Low Response Error," 1995 International Conference on Acoustics, Speech, and Signal Processing, pp. 2995-2998, May 9, 1995, 4 pp.	
		Chu, Desktop Mic Array for Teleconferencing, 1995 International Conference on Acoustics, Speech, and Signal Processing, May 1995, pp. 2999-3002.	
		ClearOne Communications, XAP Audio Conferencing White Paper, Aug. 2002, 78 pgs.	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Elizabeth Ahra CHO
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	16	of	20	Attorney Docket Number	15119.0002-01000

NONPATENT LITERATURE DOCUMENTS		
	ClearOne, Beamforming Microphone Array, March 2012, 6 pgs.	
	ClearOne, Ceiling Microphone Array Installation Manual, January 9, 2012, 20 pgs.	
	Cook, et al., An Alternative Approach to Interpolated Array Processing for Uniform Circular Arrays, Asia-Pacific Conference on Circuits and Systems, 2002, pp. 411-414.	
	Cox et al., Robust Adaptive Beamforming, IEEE Trans. Acoust., Speech, and Signal Processing, vol. ASSP-35, no. 10, Oct. 1987, pp. 1365-1376.	
	CTG Audio, Ceiling Microphone CTG CM-01, June 5, 2008, 2 pgs.	
	CTG Audio, CM-01 & CM-02 Ceiling Microphones Specifications, 2 pgs.	
	CTG Audio, CM-01 & CM-02 Ceiling Microphones, 2017, 4 pgs.	
	CTG Audio, Expand Your IP Teleconferencing to Full Room Audio, <a href="http://www.ctgaudio.com/expand-your-ip-teleconferencing-to-full-room-audio-while-conquering-echo-cancellation-issues.html">http://www.ctgaudio.com/expand-your-ip-teleconferencing-to-full-room-audio-while-conquering-echo-cancellation-issues.html</a> , Jul. 29, 2014, 3 pgs.	
	CTG Audio, Installation Manual, Nov. 21, 2008, 25 pgs.	
	CTG Audio, White on White - Introducing the CM-02 Ceiling Microphone, <a href="https://ctgaudio.com/white-on-white-introducing-the-cm-02-ceiling-microphone/">https://ctgaudio.com/white-on-white-introducing-the-cm-02-ceiling-microphone/</a> , Feb. 20, 2014, 3 pgs.	
	Dahl et al., Acoustic Echo Cancelling with Microphone Arrays, Research Report 3/95, Univ. of Karlskrona/Ronneby, April 1995, 64 pgs.	
	Desiraju et al., Efficient Multi-Channel Acoustic Echo Cancellation Using Constrained Sparse Filter Updates in the Subband Domain, ITG-Fachbericht 252: Speech Communication, Sep. 2014, 4 pgs.	
	DiBiase et al., Robust Localization in Reverberant Rooms, in Brandstein, ed., Microphone Arrays: Techniques and Applications, 2001, Springer-Verlag Berlin Heidelberg, pp. 157-180.	
	Do et al., A Real-Time SRP-PHAT Source Location Implementation using Stochastic Region Contraction (SRC) on a Large-Aperture Microphone Array, 2007 IEEE International Conference on Acoustics, Speech and Signal Processing - ICASSP '07, Apr. 2007, pp. 1-121 - 1-124.	
	Fan et al., Localization Estimation of Sound Source by Microphones Array, Procedia Engineering 7, 2010, pp. 312-317	
	Flanagan et al., Autodirective Microphone Systems, Acustica, Vol. 73, 1991, pp. 58-71.	
	Flanagan et al., Computer-Steered Microphone Arrays for Sound Transduction in Large Rooms, J. Acoust. Soc. Am. 78 (5), Nov. 1985, pp. 1508-1518.	
	Frost, III, An Algorithm for Linearly Constrained Adaptive Array Processing, Proc. IEEE, vol. 60, no. 8, Aug. 1972, pp. 926-935.	
	Gannot et al., Signal Enhancement using Beamforming and Nonstationarity with Applications to Speech, IEEE Trans. On Signal Processing, vol. 49, no. 8, Aug. 2001, pp. 1614-1626.	
	Gansler et al., A Double-Talk Detector Based on Coherence, IEEE Transactions on Communications, vol. 44, no. 11, Nov. 1996, pp. 1421-1427.	
	Gazor et al., Robust Adaptive Beamforming via Target Tracking, IEEE Transactions on Signal Processing, Vol. 44, No. 5, June 1996, pp. 1589-1593.	
	Gazor et al., Wideband Multi-Source Beamforming with Adaptive Array Location Calibration and Direction Finding, 1995 International Conference on Acoustics, Speech, and Signal Processing, May 1995, pp. 1904-1907.	
	Gentner Communications Corp., AP400 Audio Perfect 400 Audioconferencing System Installation & Operation Manual, Nov. 1998, 80 pgs.	
	Gentner Communications Corp., XAP 800 Audio Conferencing System Installation & Operation Manual, Oct. 2001, 152 pgs.	
	Gil-Cacho et al., Multi-Microphone Acoustic Echo Cancellation Using Multi-Channel Warped Linear Prediction of Common Acoustical Poles, 18th European Signal Processing Conference, Aug. 2010, pp. 2121-2125.	
	Gritton et al., Echo Cancellation Algorithms, IEEE ASSP Magazine, vol. 1, issue 2, Apr. 1984, pp. 30-38.	
	Hamalainen et al., Acoustic Echo Cancellation for Dynamically Steered Microphone Array Systems, 2007 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, Oct. 2007, pp. 58-61.	
	Herbordt, Combination of Robust Adaptive Beamforming with Acoustic Echo Cancellation for Acoustic Human/Machine Interfaces, Friedrich-Alexander University, 2003, 293 pgs.	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				<i>Application Number</i>	Not Yet Assigned
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				<i>Examiner Name</i>	Not Yet Assigned
Sheet	17	of	20	<i>Attorney Docket Number</i>	15119.0002-01000

NONPATENT LITERATURE DOCUMENTS			
		Herbordt et al., A Real-time Acoustic Human-Machine Front-End for Multimedia Applications Integrating Robust Adaptive Beamforming and Stereophonic Acoustic Echo Cancellation, 7th International Conference on Spoken Language Processing, Sept. 2002, 4 pgs.	
		Herbordt et al., GSAEC - Acoustic Echo Cancellation embedded into the Generalized Sidelobe Canceller, 10th European Signal Processing Conference, Sept. 2000, 5 pgs.	
		Herbordt et al., Joint Optimization of LCMV Beamforming and Acoustic Echo Cancellation for Automatic Speech Recognition, IEEE International Conference on Acoustics, Speech, and Signal Processing, Mar. 2005, pp. III-77 - III-80.	
		Herbordt et al., Multichannel Bin-Wise Robust Frequency-Domain Adaptive Filtering and Its Application to Adaptive Beamforming, IEEE Transactions on Audio, Speech, and Language Processing, vol. 15, no. 4, May 2007, pp. 1340-1351.	
		Huang et al., Immersive Audio Schemes: The Evolution of Multiparty Teleconferencing, IEEE Signal Processing Magazine, Jan. 2011, pp. 20-32.	
		International Search Report and Written Opinion for PCT/US2016/029751 dated Nov. 28, 2016, 21 pp.	
		InvenSense Inc., Microphone Array Beamforming, Dec. 31, 2013, 12 pgs.	
		Ishii et al., Investigation on Sound Localization using Multiple Microphone Arrays, Reflection and Spatial Information, Japanese Society for Artificial Intelligence, JSAI Technical Report, SIG-Challenge-B202-11, 2012, pp. 64-69.	
		Ito et al., Aerodynamic/Aeroacoustic Testing in Anechoic Closed Test Sections of Low-speed Wind Tunnels, 16th AIAA/CEAS Aeroacoustics Conference, 2010, 11 pgs.	
		Johansson et al., Robust Acoustic Direction of Arrival Estimation using Root-SRP-PHAT, a Realtime Implementation, IEEE International Conference on Acoustics, Speech, and Signal Processing, Mar. 2005, 4 pgs.	
		Johansson, et al., Speaker Localisation using the Far-Field SRP-PHAT in Conference Telephony, 2002 International Symposium on Intelligent Signal Processing and Communication Systems, 5 pgs.	
		Julstrom et al., Direction-Sensitive Gating: A New Approach to Automatic Mixing, J. Audio Eng. Soc., vol. 32, no. 7/8, July/August 1984, pp. 490-506.	
		Kahrs, Ed., The Past, Present, and Future of Audio Signal Processing, IEEE Signal Processing Magazine, Sept. 1997, pp. 30-57.	
		Kallinger et al., Multi-Microphone Residual Echo Estimation, 2003 IEEE International Conference on Acoustics, Speech, and Signal Processing, Apr. 2003, 4 pgs.	
		Kammeyer, et al., New Aspects of Combining Echo Cancellers with Beamformers, IEEE International Conference on Acoustics, Speech, and Signal Processing, Mar. 2005, pp. III-137 - III-140.	
		Kellermann, A Self-Steering Digital Microphone Array, 1991 International Conference on Acoustics, Speech, and Signal Processing, Apr. 1991, pp. 3581-3584.	
		Kellermann, Acoustic Echo Cancellation for Beamforming Microphone Arrays, in Brandstein, ed., Microphone Arrays: Techniques and Applications, 2001, Springer-Verlag Berlin Heidelberg, pp. 281-306.	
		Kellermann, Integrating Acoustic Echo Cancellation with Adaptive Beamforming Microphone Arrays, Forum Acusticum, Berlin, Mar. 1999, pp. 1-4.	
		Kellermann, Strategies for Combining Acoustic Echo Cancellation and Adaptive Beamforming Microphone Arrays, 1997 IEEE International Conference on Acoustics, Speech, and Signal Processing, Apr. 1997, 4 pgs.	
		Knapp, et al., The Generalized Correlation Method for Estimation of Time Delay, IEEE Transactions on Acoustics, Speech, and Signal Processing, vol. ASSP-24, no. 4, Aug. 1976, pp. 320-327.	
		Kobayashi et al., A Hands-Free Unit with Noise Reduction by Using Adaptive Beamformer, IEEE Transactions on Consumer Electronics, vol. 54, no. 1, Feb. 2008, pp. 116-122.	
		Kobayashi et al., A Microphone Array System with Echo Canceller, Electronics and Communications in Japan, Part 3, Vol. 89, No. 10, February 2, 2006, pp. 23-32.	
		Lebret, et al., Antenna Array Pattern Synthesis via Convex Optimization, IEEE Trans. on Signal Processing, vol. 45, no. 3, Mar. 1997, pp. 526-532.	
		Lectrosonics, LecNet2 Sound System Design Guide, June 2006, 28 pgs.	
		Lee et al., Multichannel Teleconferencing System with Multispatial Region Acoustic Echo Cancellation, International Workshop on Acoustic Echo and Noise Control (IWAENC2003), Sept. 2003, pp. 51-54.	
		Lindstrom et al., An Improvement of the Two-Path Algorithm Transfer Logic for Acoustic Echo Cancellation, IEEE Transactions on Audio, Speech, and Language Processing, vol. 15, no. 4, May 2007, pp. 1320-1326.	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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				Examiner Name	Not Yet Assigned
Sheet	18	of	20	Attorney Docket Number	15119.0002-01000

NONPATENT LITERATURE DOCUMENTS			
		Liu et al., Adaptive Beamforming with Sidelobe Control: A Second-Order Cone Programming Approach, IEEE Signal Proc. Letters, vol. 10, no. 11, Nov. 2003, pp. 331-334.	
		Lobo, et al., Applications of Second-Order Cone Programming, Linear Algebra and its Applications 284, 1998, pp. 193-228.	
		Luo et al., Wideband Beamforming with Broad Nulls of Nested Array, Third Int'l Conf. on Info. Science and Tech., Mar. 23-25, 2013, pp. 1645-1648.	
		Marquardt et al., A Natural Acoustic Front-End for Interactive TV in the EU-Project DICIT, IEEE Pacific Rim Conference on Communications, Computers and Signal Processing, Aug. 2009, pp. 894-899.	
		Martin, Small Microphone Arrays with Postfilters for Noise and Acoustic Echo Reduction, in Brandstein, ed., Microphone Arrays: Techniques and Applications, 2001, Springer-Verlag Berlin Heidelberg, pp. 255-279.	
		Maruo et al., On the Optimal Solutions of Beamformer Assisted Acoustic Echo Cancellers, IEEE Statistical Signal Processing Workshop, 2011, pp. 641-644.	
		McCowan, Microphone Arrays: A Tutorial, April 2001, 36 pgs.	
		Mohammed, A New Adaptive Beamformer for Optimal Acoustic Echo and Noise Cancellation with Less Computational Load, Canadian Conference on Electrical and Computer Engineering, May 2008, pp. 000123-000128.	
		Mohammed, A New Robust Adaptive Beamformer for Enhancing Speech Corrupted with Colored Noise, AICCSA, April 2008, pp. 508-515.	
		Mohammed, Real-time Implementation of an efficient RLS Algorithm based on IIR Filter for Acoustic Echo Cancellation, AICCSA, April 2008, pp. 489-494.	
		Myllyla et al., Adaptive Beamforming Methods for Dynamically Steered Microphone Array Systems, 2008 IEEE International Conference on Acoustics, Speech and Signal Processing, Mar.-Apr. 2008, pp. 305-308.	
		Nguyen-Ky et al., An Improved Error Estimation Algorithm for Stereophonic Acoustic Echo Cancellation Systems, 1st International Conference on Signal Processing and Communication Systems, Dec. 2007, 5 pgs.	
		Oh et al., Hands-Free Voice Communication in an Automobile With a Microphone Array, 1992 IEEE International Conference on Acoustics, Speech, and Signal Processing, Mar. 1992, pp. 1-281-1-284.	
		Omologo, Multi-Microphone Signal Processing for Distant-Speech Interaction, Human Activity and Vision Summer School (HAVSS), INRIA Sophia Antipolis, Oct. 3, 2012, 79 pgs.	
		Pados et al., An Iterative Algorithm for the Computation of the MVDR Filter, IEEE Trans. On Signal Processing, vol. 49, no. 2, Feb. 2001, pp. 290-300.	
		Pettersen, Broadcast Applications for Voice-Activated Microphones, db, July/August 1985, 6 pgs.	
		Plascore, PCGA-XR1 3003 Aluminum Honeycomb Data Sheet, 2008, 2 pgs.	
		Polycom Inc., Vortex EF2211/EF2210 Reference Manual, 2003, 66 pgs.	
		Polycom, Inc., Polycom SoundStructure C16, C12, C8, and SR12 Design Guide, Nov. 2013, 743 pgs.	
		Polycom, Inc., Setting Up the Polycom HDX Ceiling Microphone Array Series, <a href="https://support.polycom.com/content/dam/polycom-support/products/Telepresence-and-Video/HDX%20Series/setup-maintenance/en/hdx_ceiling_microphone_array_setting_up.pdf">https://support.polycom.com/content/dam/polycom-support/products/Telepresence-and-Video/HDX%20Series/setup-maintenance/en/hdx_ceiling_microphone_array_setting_up.pdf</a> , 2010, 16 pgs.	
		Polycom, Inc., Vortex EF2241 Reference Manual, 2002, 68 pgs.	
		Powers, Proving Adaptive Directional Technology Works: A Review of Studies, The Hearing Review, <a href="http://www.hearingreview.com/2004/04/proving-adaptive-directional-technology-works-a-review-of-studies/">http://www.hearingreview.com/2004/04/proving-adaptive-directional-technology-works-a-review-of-studies/</a> , Apr. 2004, 8 pgs.	
		Rabinkin et al., Estimation of Wavefront Arrival Delay Using the Cross-Power Spectrum Phase Technique, 132nd Meeting of the Acoustical Society of America, Dec. 1996, pp. 1-10.	
		Rane Corp., Halogen Acoustic Echo Cancellation Guide, AEC Guide Version 2, Nov. 2013, 16 pgs.	
		Rao et al., Fast LMS/Newton Algorithms for Stereophonic Acoustic Echo Cancellation, IEEE Transactions on Signal Processing, vol. 57, no. 8, Aug. 2009, pp. 2919-2930.	
		Reuven et al., Joint Acoustic Echo Cancellation and Transfer Function GSC in the Frequency Domain, 23rd IEEE Convention of Electrical and Electronics Engineers in Israel, Sep. 2004, pp. 412-415.	
		Reuven et al., Joint Noise Reduction and Acoustic Echo Cancellation Using the Transfer-Function Generalized Sidelobe Canceller, Speech Communication, vol. 49, 2007, pp. 623-635.	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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				Examiner Name	Not Yet Assigned
Sheet	19	of	20	Attorney Docket Number	15119.0002-01000

NONPATENT LITERATURE DOCUMENTS			
		Reuven et al., Multichannel Acoustic Echo Cancellation and Noise Reduction in Reverberant Environments Using the Transfer-Function GSC, 2007 IEEE International Conference on Acoustics, Speech and Signal Processing - ICASSP 07, Apr. 2007, pp. 1-81 -1-84.	
		Ristimäki, Distributed Microphone Array System for Two-Way Audio Communication, Helsinki Univ. of Technology, Master's Thesis, June 15, 2009, 73 pgs.	
		Rombouts et al., An Integrated Approach to Acoustic Noise and Echo Cancellation, Signal Processing 85, 2005, pp. 849-871.	
		Sasaki et al., A Predefined Command Recognition System Using a Ceiling Microphone Array in Noisy Housing Environments, 2008 IEEE/RSJ International Conference on Intelligent Robots and Systems, Sep. 2008, pp. 2178-2184.	
		Sennheiser, New microphone solutions for ceiling and desk installation, <a href="https://en-us.sennheiser.com/news-new-microphone-solutions-for-ceiling-and-desk-installation">https://en-us.sennheiser.com/news-new-microphone-solutions-for-ceiling-and-desk-installation</a> , Feb. 2011, 2 pgs.	
		Sennheiser, TeamConnect Ceiling, <a href="https://en-us.sennheiser.com/conference-meeting-rooms-teamconnect-ceiling">https://en-us.sennheiser.com/conference-meeting-rooms-teamconnect-ceiling</a> , 7 pgs.	
		Shure AMS Update, vol. 1, no. 1, 1983, 2 pgs.	
		Shure AMS Update, vol. 1, no. 2, 1983, 2 pgs.	
		Shure AMS Update, vol. 4, no. 4, 1997, 8 pgs.	
		Shure Inc., Microflex Advance, <a href="http://www.shure.com/americas/microflex-advance">http://www.shure.com/americas/microflex-advance</a> , 12 pgs.	
		Shure Inc., MX395 Low Profile Boundary Microphones, 2007, 2 pgs.	
		Shure Inc., MXA910 Ceiling Array Microphone, <a href="http://www.shure.com/americas/products/microphones/microflex-advance/mxa910-ceiling-array-microphone">http://www.shure.com/americas/products/microphones/microflex-advance/mxa910-ceiling-array-microphone</a> , 7 pgs.	
		Silverman et al., Performance of Real-Time Source-Location Estimators for a Large-Aperture Microphone Array, IEEE Transactions on Speech and Audio Processing, vol. 13, no. 4, July 2005, pp. 593-606.	
		Sinha, Ch. 9: Noise and Echo Cancellation, in Speech Processing in Embedded Systems, Springer, 2010, pp. 127-142.	
		Soda et al., Introducing Multiple Microphone Arrays for Enhancing Smart Home Voice Control, The Institute of Electronics, Information and Communication Engineers, Technical Report of IEICE, Jan. 2013, 6 pgs.	
		Symetrix, Inc., SymNet Network Audio Solutions Brochure, 2008, 32 pgs.	
		Tandon et al., An Efficient, Low-Complexity, Normalized LMS Algorithm for Echo Cancellation, 2nd Annual IEEE Northeast Workshop on Circuits and Systems, Jun. 2004, pp. 161-164.	
		Tetelbaum et al., Design and Implementation of a Conference Phone Based on Microphone Array Technology, Proc. Global Signal Processing Conference and Expo (GSPx), Sep. 2004, 6 pgs.	
		Tiete et al., SoundCompass: A Distributed MEMS Microphone Array-Based Sensor for Sound Source Localization, SENSORS, Jan. 23, 2014, pp. 1918-1949.	
		TOA Corp., Ceiling Mount Microphone AN-9001 Operating Instructions, <a href="http://www.toaelectronics.com/media/an9001_mt1e.pdf">http://www.toaelectronics.com/media/an9001_mt1e.pdf</a> , 1 pg.	
		Van Compernelle, Switching Adaptive Filters for Enhancing Noisy and Reverberant Speech from Microphone Array Recordings, Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing, Apr. 1990, pp. 833-836.	
		Van Trees, Optimum Array Processing: Part IV of Detection, Estimation, and Modulation Theory, 2002, 54 pgs., pp. i-xxv, 90-95, 201-230.	
		Van Veen et al., Beamforming: A Versatile Approach to Spatial Filtering, IEEE ASSP Magazine, vol. 5, issue 2, Apr. 1988, pp. 4-24.	
		Wang et al., Combining Superdirective Beamforming and Frequency-Domain Blind Source Separation for Highly Reverberant Signals, EURASIP Journal on Audio, Speech, and Music Processing, vol. 2010, pp. 1-13.	
		Weinstein et al., LOUD: A 1020-Node Microphone Array and Acoustic Beamformer, 14th International Congress on Sound & Vibration, July 2007, 8 pgs.	
		Wung, A System Approach to Multi-Channel Acoustic Echo Cancellation and Residual Echo Suppression for Robust Hands-Free Teleconferencing, Georgia Institute of Technology, May 2015, 167 pgs.	
		Yamaha Corp., MRX7-D Signal Processor Product Specifications, 2016, 12 pgs.	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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Sheet	20	of	20	<i>Attorney Docket Number</i>	15119.0002-01000

NONPATENT LITERATURE DOCUMENTS			
		Yamaha Corp., PJP-100H IP Audio Conference System Owner's Manual, Sep. 2006, 59 pgs.	
		Yamaha Corp., PJP-EC200 Conference Echo Canceller, Oct. 2009, 2 pgs.	
		Yan et al., Convex Optimization Based Time-Domain Broadband Beamforming with Sidelobe Control, Journal of the Acoustical Society of America, vol. 121, no. 1, Jan. 2007, pp. 46-49.	
		Yensen et al., Synthetic Stereo Acoustic Echo Cancellation Structure with Microphone Array Beamforming for VOIP Conferences, 2000 IEEE International Conference on Acoustics, Speech, and Signal Processing, Jun. 2000, pp. 817-820.	
		Zhang et al., Multichannel Acoustic Echo Cancellation in Multiparty Spatial Audio Conferencing with Constrained Kalman Filtering, 11th International Workshop on Acoustic Echo and Noise Control, Sep. 2008, 4 pgs.	
		Zhang et al., Selective Frequency Invariant Uniform Circular Broadband Beamformer, EURASIP Journal on Advances in Signal Processing, Vol. 2010, pp. 1-11.	
		Zheng et al., Experimental Evaluation of a Nested Microphone Array with Adaptive Noise Cancellers, IEEE Transactions on Instrumentation and Measurement, vol. 53, no. 3, Jun. 2004, pg. 777-786.	

Examiner Signature		Date Considered	
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Sheet	1	of	3	<i>Attorney Docket Number</i>	15119.0002-01000

U.S. PATENTS					
Examiner Initials <sup>1</sup>	Cite No. <sup>1</sup>	Document Number	Issue or Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
		US-1965830	07-10-1934	Hammer	
		US-2521603	09-05-1950	Prew	
		US-2533565	12-12-1950	Eichelman	
		US-2840181	06-24-1958	Wildman	
		US-2912605	11-10-1959	Tibbetts	
		US-2938113	05-24-1960	Schnell et al.	
		US-3019854	02-06-1962	O'Bryant	
		US-3143182	08-04-1964	Sears et al.	
		US-3161975	12-22-1964	McMillan, J.L.	
		US-3205601	09-14-1965	Gawne et al.	
		US-3509290	04-28-1970	Mochida et al.	
		US-3857191	12-31-1974	Sadorus, George P.	
		US-3938617	02-17-1976	Forbes, Lonnie R.	
		US-3941638	03-02-1976	Horky et al.	
		US-4008408	02-15-1977	Kodama, Akihiko	
		US-4029170	06-14-1977	Phillips, Jesse O.	
		US-4032725	06-28-1977	McGee, Paul Dean	
		US-4244096	01-13-1981	Kashichi, Hirota	
		US-4518826	05-21-1985	Caudill et al.	
		US-4566557	01-28-1986	Lemaitre, Guy	
		US-4969197	11-06-1990	Takaya, Tadashi	
		US-5038935	08-13-1991	Wenkman et al.	
		US-5322979	06-21-1994	Cassity et al.	
		US-5359374	10-25-1994	Schwartz, Jeffrey M.	
		US-5383293	01-24-1995	Royal, John D.	
		US-5400413	03-21-1995	Kindel, William J.	
		US-6035962	03-14-2000	Lin, Chih-Hsiung	
		US-6144746	11-07-2000	Azima et al.	
		US-6198831	03-06-2001	Azima et al.	
		US-6266427	07-24-2001	Mathur, Gopal P.	
		US-6285770	09-04-2001	Azima et al.	
		US-6393129	05-21-2002	Conrad et al.	
		US-6993145	01-31-2006	Combest, Christopher	
		US-7387151	06-17-2008	Payne, Donald L.	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (2)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
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Sheet	2	of	3	<i>Attorney Docket Number</i>	15119.0002-01000

U.S. PATENTS					
		US-7565949	07-28-2009	Tojo, Makoto	
		US-8064629	11-22-2011	Jiang, Peigen	
		US-8670581	03-11-2014	Harman	
		US-D255234	06-03-1980	Wellward et al.	
		US-D256015	07-22-1980	Doherty, Glenn F.	
		US-D329239	09-08-1992	Hahn, Richard	
		US-D340718	10-26-1993	Leger et al.	
		US-D345346	03-22-1994	Alfonso et al.	
		US-D345379	03-22-1994	Chan, Robert J.	
		US-D363045	10-10-1995	Phillips et al.	
		US-D392977	03-31-1998	Kim, Byung Hwa	
		US-D394061	05-05-1998	Fink, David	
		US-D424538	05-09-2000	Hayashi et al.	
		US-D432518	10-24-2000	Muto, Keiko	
		US-D453016	01-22-2002	Nevill et al.	
		US-D489707	05-11-2004	Kobayashi, Tomohiko	
		US-D504889	12-19-2014	Andre et al.	
		US-D526643	08-15-2006	Ishizaki, Hideaki	
		US-D527372	08-29-2006	Allen, Graham David	
		US-D542543	05-15-2007	Bruce, David	
		US-D546318	07-10-2007	Yoon et al.	
		US-D547748	07-31-2007	Tsuge, Takahiro	
		US-D549673	08-28-2007	Niitsu, Takuya	
		US-D552570	10-09-2007	Niitsu, Takuya	
		US-D599553	01-15-2008	Mischel, Jr.	
		US-D566685	04-15-2008	Koller et al.	
		US-D587709	03-03-2009	Niitsu et al.	
		US-D589605	03-31-2009	Reedy et al.	
		US-D595736	07-07-2009	Son et al.	
		US-D613338	04-06-2010	Marukos, Chris	
		US-D614871	05-04-2010	Tang et al.	
		US-D636188	04-19-2011	Kim et al.	
		US-D642385	08-02-2011	Lee et al.	
		US-D685346	07-02-2013	Szymanski et al.	
		US-D717272	11-11-2014	Kim et al.	
		US-D725631	03-31-2015	McNamara, Greg	

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (2)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Elizabeth Ahra CHO
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	3	of	3	Attorney Docket Number	15119.0002-01000

U.S. PATENTS					
		US-D726144	04-07-2015	Kang, Hwayoung	
		US-D729767	05-19-2015	Lee et al.	
		US-D737245	08-25-2015	Fan et al.	
		US-D743376	11-17-2015	Kim, Junki	
		US-D743939	11-24-2015	Seong, Bo-Kyung	
		US-D754103	04-19-2016	Fischer et al.	

U.S. PUBLISHED PATENT APPLICATIONS					
Examiner Initials <sup>*</sup>	Cite No. <sup>3</sup>	Document Number	Issue or Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>4</sup> (if known)			
		US-20060159293	07-20-2006	Azima et al.	
		US-20060198541	09-07-2006	Henry, Todd	
		US-20060215866	09-28-2006	Francisco et al.	
		US-20090087001	04-02-2009	Jiang	
		US-20100011644	01-21-2010	Kramer, Eric J.	
		US-20140233777	08-21-2014	Tseng et al.	

**Note: Submission of copies of U.S. Patents and published U.S. Patent Applications is not required.**

FOREIGN PATENT DOCUMENTS						
Examiner Initials <sup>*</sup>	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	Translation <sup>8</sup>
		Country Code <sup>5</sup> Number <sup>6</sup> Kind Code <sup>7</sup> (if known)				

NONPATENT LITERATURE DOCUMENTS			
Examiner Initials <sup>*</sup>	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	Translation <sup>6</sup>
		Office Action issued for Japanese Patent Application No. 2015-023781 dated Jun. 20, 2016	

Examiner Signature		Date Considered	
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EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

PTO Notes regarding this form:

<sup>1</sup> Applicant's unique citation designation number (optional).

<sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.

<sup>3</sup> Applicant's unique citation designation number (optional).

<sup>4</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.

<sup>5</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).

<sup>6</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

<sup>7</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible.

<sup>8</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**



整理番号 X1W2169

発送番号 027357

7 6 6, 20

発送日 平成28年 6月20日 頁: 1/ 2

**拒絶理由通知書**  
**OFFICIAL ACTION**

意匠登録出願の番号	意願2015-023781
特許庁審査官	石坂 陽子 3096
起案日	平成28年 6月16日
意匠登録出願人代理人	西島 孝喜(外 6名)様

この意匠登録出願については、以下のとおり、登録要件を満たさない理由がありますので、意匠法第19条で準用する特許法第50条の規定に基づき、通知します。

この理由について意見があれば、この通知書を送付した日から3か月以内に意見書を提出することができます。

なお、意見書の提出があったときには、その内容を考慮した上で、登録の可否について審査いたします。

**理 由**

この意匠登録出願の意匠は、下記に示すように、出願前にその意匠の属する分野における通常の知識を有する者が日本国内又は外国において公然知られた形状、模様若しくは色彩又はこれらの結合に基づいて容易に意匠の創作をすることができたものと認められますので、意匠法第3条第2項の規定に該当します。

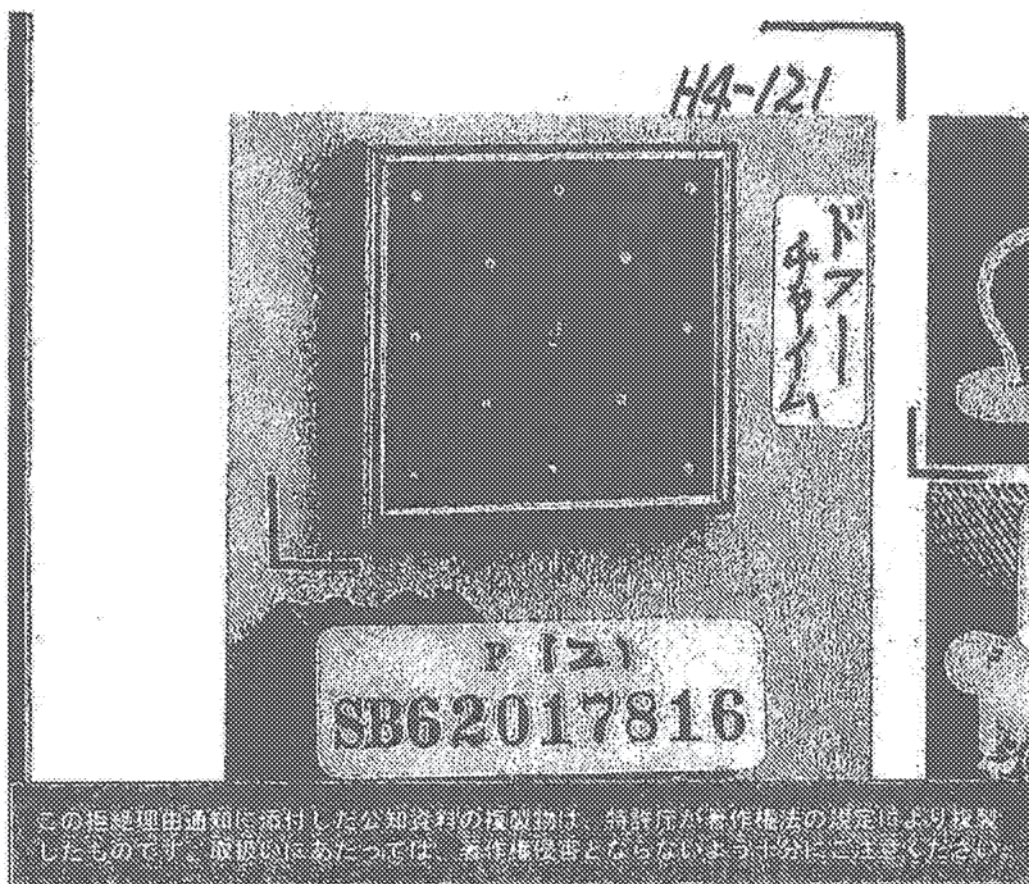
**記**

本願意匠は、パネル状のマイクロホンの縁部分を、意匠登録を受けようとする部分として表したものであって、当該部分は特段の装飾のないシンプルな額縁状の態様をしていますが、例えば以下の意匠のように、本願意匠と同様、音を発する類の物品であるドアチャイムの分野には、全体形状がパネル状であって縁を特段の装飾がないシンプルな額縁状とした態様が本願出願前に見られることから、本願の意匠は本願出願前の意匠をもとに、当業界の通常の知識を有する者が容易に創作できたものと認められます。

発送番号 027357

頁: 2/ 2

特許庁総合情報館が1987年 6月16日に受け入れた  
HOME lighting & ACCESSORIES 1987年  
5月31日5号  
第121頁所載  
ドアーチャイムの意匠  
(特許庁意匠課公知資料番号第SB62017816号)



この拒絶理由通知の内容に関するお問い合わせ、または面接のご希望がございましたら下記までご連絡ください。

審査第一部 情報・交通意匠 石坂 陽子

電話 03 (3581) 1101 内線—— ファクシミリ 03 (3595) 2766



(Translation)

Dispatched on June 30, 2016

Notification of Reason for Rejection

Design Application No. 2015-023781  
Examiner: Y. Ishizaka  
Drafting Date: June 16, 2016  
Agents for the applicant: Mr. T. Nishijima, et al.

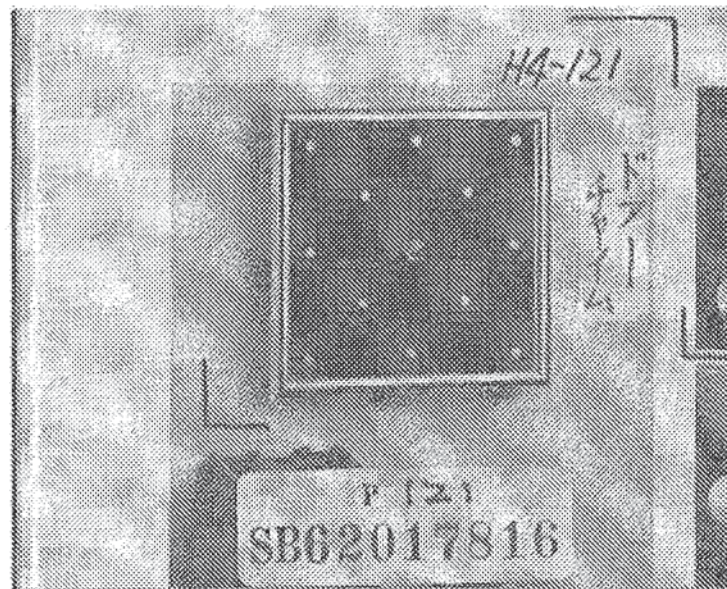
The above mentioned application is rejected based on the grounds set out hereunder in view of the provisions of Article 19. The applicant can file an argument against the Official Action within three months from the date of dispatch of this Notification.

**Ground (lack of creative difficulty):**

It is considered that the present design of the above-identified application could have easily been created by those skilled in the art on the basis of the shape, pattern, color and combination thereof which were publicly known in Japan or other countries prior to the filing date of the present application, and therefore it is rejected as being unregistrable in view of the provisions of Article 3, Para. 2 of the Design Law.

**Design cited by the Examiner:**

A design of a door chime which was shown in "HOME lighting & ACCESSORIES" on page 121, vol. 5, published on May 31, 1987, which was received by the Japanese Patent Office on June 16, 1987.





**Remarks:**

The present invention is a partial design regarding an edge portion of a microphone in a panel form.

The edge portion has a configuration of a simple (picture) frame without a specific ornamentation.

A design of a door chime can be found prior to the priority date of the present application; the door chime is a kind of making a sound like the present article, the design having a configuration of a simple (picture frame) without a specific ornamentation.

Thus, the present design could be easily made by those skilled in the art in view of the design found prior to the priority date of the present application.

## TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	Not Yet Assigned
Filing Date	August 6, 2019
First Named Inventor	Elizabeth Ahra CHO
Title	ARRAY MICROPHONE ASSEMBLY
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	15119.0002-01000

### SIGNATURE of Applicant or Patent Practitioner

Signature	/Elizabeth D. Ferrill/	Date (Optional)	August 6, 2019
Name	Elizabeth D. Ferrill	Registration Number	58415
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



\*Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**



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I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

22,852

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☒ The address associated with the above-mentioned Customer Number

OR

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OR

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City

State

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Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Shure Acquisition Holdings, Inc.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

### SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional) Aug. 5, 2019

Name

Title

Exec. Vice President, General Counsel and Secretary

**NOTE:** Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 422 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>				
<b>Filing Date:</b>				
<b>Title of Invention:</b>	ARRAY MICROPHONE ASSEMBLY			
<b>First Named Inventor/Applicant Name:</b>	Elizabeth Ahra CHO			
<b>Filer:</b>	Elizabeth Diane Ferrill/Charlene Woods			
<b>Attorney Docket Number:</b>	15119.0002-01000			
Filed as Large Entity				
<b>Filing Fees for Design</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
DESIGN APPLICATION FILING	1012	1	200	200
DESIGN OR DESIGN CPA SEARCH FEE	1112	1	160	160
DESIGN OR DESIGN CPA EXAMINATION FEE	1312	1	600	600
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
REQUEST EXPEDITED EXAM OF DESIGN APPL	1802	1	900	900
<b>Petition:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1860



**Electronic Acknowledgement Receipt**

<b>EFS ID:</b>	36800931
<b>Application Number:</b>	29700875
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	5596
<b>Title of Invention:</b>	ARRAY MICROPHONE ASSEMBLY
<b>First Named Inventor/Applicant Name:</b>	Elizabeth Ahra CHO
<b>Customer Number:</b>	22852
<b>Filer:</b>	Elizabeth Diane Ferrill/Charlene Woods
<b>Filer Authorized By:</b>	Elizabeth Diane Ferrill
<b>Attorney Docket Number:</b>	15119.0002-01000
<b>Receipt Date:</b>	06-AUG-2019
<b>Filing Date:</b>	
<b>Time Stamp:</b>	17:36:40
<b>Application Type:</b>	Design

**Payment information:**

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$1860
RAM confirmation Number	E201986H37388000
Deposit Account	
Authorized User	

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**File Listing:**

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	Application_Transmittal_Letter_15119_0002-01.pdf	17941	no	2
			4e978d1f6c24bf674d6bb3fe6b65921ddca5c885		

**Warnings:****Information:**

2		Specification_15119_0002-01.pdf	13200	yes	3
			8107cf4be75cb20c0c6912928a33d80e1d2ec2ed		

**Multipart Description/PDF files in .zip description**

	Document Description		Start	End
	Specification		1	2
	Claims		3	3

**Warnings:****Information:**

3	Drawings-only black and white line drawings	FIGURES_15119_0002-01.pdf	204044	no	5
			b5426a7d42c5ec7067467702b6e9ab8d32da6d44		

**Warnings:****Information:**

4	Req for Expedited Processing, Design Rocket Docket	Request_for_Expedited_Examination_15119_0002-01.pdf	218739	no	2
			07ec3ab267318849597dcde238c2f37c009505e9		

**Warnings:****Information:**

5	Req for Expedited Processing, Design Rocket Docket	Request_for_Expedited_Examination_Additional_Sheet_15119_0002-01.pdf	10949	no	1
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**Warnings:****Information:**

6	Application Data Sheet	Application_Data_Sheet_15119_0002-01.pdf	1256613 cd861a52a8aaa421febcb8d883877387c510ff63	no	9
<b>Warnings:</b>					
<b>Information:</b>					
7	Oath or Declaration filed	Declaration_CHO_15119_0002-01.pdf	166339 bfdd11b432746effe429da0802cac0818a8092ce	no	2
<b>Warnings:</b>					
<b>Information:</b>					
8	Oath or Declaration filed	Declaration_LANTZ_15119_0002-01.pdf	231856 9b864bedb7a7bad727c4cfbf78bf2fcc6de39e2e	no	1
<b>Warnings:</b>					
<b>Information:</b>					
9	Oath or Declaration filed	Declaration_MILLER_15119_0002-01.pdf	237947 e15a86211a31bbb5babc180361d5b4731b1de6fa	no	2
<b>Warnings:</b>					
<b>Information:</b>					
10	Transmittal Letter	IDS_Transmittal_15119_0002-01.pdf	16612 33f35d2542fa7b2228f6e42b7526ceca88ec21e8	no	2
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<b>Information:</b>					
11	Information Disclosure Statement (IDS) Form (SB08)	PTO-SB-08-1_15199_0002-01.pdf	225883 ce261bb9175037b5e33088fc283044a7d99e335f	no	21
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<b>Information:</b>					
This is not an USPTO supplied IDS fillable form					
12	Information Disclosure Statement (IDS) Form (SB08)	PTO-SB-08-2_15119_0002-01.pdf	46994 ae93fd733423bcd5aee09c18eed69429f291d02	no	4
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<b>Information:</b>					
This is not an USPTO supplied IDS fillable form					



13	Non Patent Literature	JP_OA_15119_0002-01.pdf	274422 dde29d1fd0497d6a128e05845a19f4991fb36672	no	4
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<b>Information:</b>					
14	Power of Attorney	POA_Trans_Letter_15119_0002-01.pdf	173893 f10fce266cb0f7a0e21c69c3fa9b3982e147c1ad	no	1
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<b>Information:</b>					
15	Power of Attorney	POA_15119_0002-01.pdf	2827948 7b15460685fc0eb47b465cf9df511c44eb097c4	no	2
<b>Warnings:</b>					
<b>Information:</b>					
16	Fee Worksheet (SB06)	fee-info.pdf	36751 e0a8c4421fd669cf56f5dd451d99b604df38c2ed	no	2
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			5960131		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
 United States Patent and Trademark Office  
 Address: COMMISSIONER FOR PATENTS  
 P.O. Box 1450  
 Alexandria, Virginia 22313-1450  
 www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
29/700,875	08/06/2019	2913	960	15119.0002-01000	1	1

CONFIRMATION NO. 5596

## FILING RECEIPT



0000000110273247

22852  
 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER  
 LLP  
 901 NEW YORK AVENUE, NW  
 WASHINGTON, DC 20001-4413

Date Mailed: 08/09/2019

Receipt is acknowledged of this non-provisional design patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

**Please verify the accuracy of the data presented on this receipt.** If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

**Inventor(s)**

Elizabeth Ahra Cho, Wilmette, IL;  
 Gregory William Lantz, Aurora, IL;  
 John Matthew Miller, Grayslake, IL;

**Applicant(s)**

Shure Acquisition Holdings, Inc, Niles, IL

**Power of Attorney:** The patent practitioners associated with Customer Number 22852

**Domestic Priority data as claimed by applicant**

This application is a CON of 15/833,404 12/06/2017  
 which is a CON of 15/631,310 06/23/2017 ABN  
 which is a CON of 15/403,765 01/11/2017 ABN  
 which is a CON of 14/701,376 04/30/2015 PAT 9565493

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

**Permission to Access Application via Priority Document Exchange:** Yes

**Permission to Access Search Results:** Yes



Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

**If Required, Foreign Filing License Granted:** 08/08/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 29/700,875**

**Projected Publication Date:** None, application is not eligible for pre-grant publication

**Non-Publication Request:** No

**Early Publication Request:** No  
**Title**

ARRAY MICROPHONE ASSEMBLY

**Preliminary Class**

D14

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific



countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

## **LICENSE FOR FOREIGN FILING UNDER**

### **Title 35, United States Code, Section 184**

### **Title 37, Code of Federal Regulations, 5.11 & 5.15**

#### **GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

#### **NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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## ***SelectUSA***

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
29/700,875	08/06/2019	Elizabeth Ahra Cho	15119.0002-01000	5596
22852	7590	09/09/2019		
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			EXAMINER HATTAN, SUSAN B	
			ART UNIT	PAPER NUMBER
			2918	
			NOTIFICATION DATE	DELIVERY MODE
			09/09/2019	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

regional-desk@finnegan.com



<b>Decision on Request for Expedited Examination of a Design Application</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	29/700,875	Cho et al.	
	<b>Examiner</b>	<b>Art Unit</b>	<b>AIA (FITF) Status</b>
	Susan Bennett Hattan	2918	Yes

This decision is in response to the request for an expedited examination of Design Application filed 06 August 2019

☒ **Request GRANTED** - Your request under 37 CFR 1.155 has been considered and approved.

☐ **Other Comments:** \_\_\_\_\_

This decision is issued on behalf of and with authorization by the Director, Technology Center 2900. Any inquiry regarding this decision should be directed to the undersigned.

/SUSAN BENNETT HATTAN/  
*Supervisory Patent Examiner*  
*Technology Center 2900*  
*Phone: (571)272-6024*



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## NOTICE OF ALLOWANCE AND FEE(S) DUE

22852 7590 09/30/2019  
 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER  
 LLP  
 901 NEW YORK AVENUE, NW  
 WASHINGTON, DC 20001-4413

EXAMINER

GREENE, PAULA ALLEN

ART UNIT

PAPER NUMBER

2912

DATE MAILED: 09/30/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
29/700,875	08/06/2019	Elizabeth Ahra Cho	15119.0002-01000	5596

TITLE OF INVENTION: ARRAY MICROPHONE ASSEMBLY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$700	\$0.00	\$0.00	\$700	12/30/2019

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

**HOW TO REPLY TO THIS NOTICE:**

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at [www.uspto.gov/PatentMaintenanceFees](http://www.uspto.gov/PatentMaintenanceFees).**



## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

22852 7590 09/30/2019

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER  
LLP  
901 NEW YORK AVENUE, NW  
WASHINGTON, DC 20001-4413

**Certificate of Mailing or Transmission**

hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
29/700,875	08/06/2019	Elizabeth Ahra Cho	15119.0002-01000	5596

TITLE OF INVENTION: ARRAY MICROPHONE ASSEMBLY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$700	\$0.00	\$0.00	\$700	12/30/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
GREENE, PAULA ALLEN	2912	D14-225000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. \_\_\_\_\_

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_





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 United States Patent and Trademark Office  
 Address: COMMISSIONER FOR PATENTS  
 P.O. Box 1450  
 Alexandria, Virginia 22313-1450  
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
29/700,875	08/06/2019	Elizabeth Ahra Cho	15119.0002-01000	5596
22852	7590	09/30/2019	EXAMINER	
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			GREENE, PAULA ALLEN	
			ART UNIT	PAPER NUMBER
			2912	
DATE MAILED: 09/30/2019				

**Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**  
 (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.



## OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

### Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b) (2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



<b>Notice of Allowability For A Design Application</b>	<b>Application No.</b> 29/700,875	<b>Applicant(s)</b> Cho et al.	
	<b>Examiner</b> PAULA Allen GREENE	<b>Art Unit</b> 2912	<b>AIA (FITF) Status</b> Yes

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308. This notice does not set or reset the time period for paying the issue fee. The issue fee must be paid within THREE MONTHS FROM THE MAILING DATE of the Notice of Allowance (PTOL-85) or this application shall be regarded as ABANDONED. This statutory period cannot be extended. See 35 U.S.C.151.

1. ☒ This communication is responsive to the Request for Expedited Examination 37 CFR 1.155 .  
☐ A declaration(s)/affidavit(s) under 37 CFR 1.130(b) was/were filed on \_\_\_\_ .

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_ the restriction requirement and election have been incorporated into this action.

3. ☒ The claim is allowed.

4. ☒ Acceptable drawings:  
 (a) ☒ The drawings filed on 8/6/2019 are accepted by the Examiner.  
 (b) ☐ Drawing Figures filed on \_\_\_\_ and drawing Figures filed on \_\_\_\_ are accepted by the Examiner.

5. ☐ The claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f) is acknowledged.

**Certified copies:**  
 a) ☐ All      b) ☐ Some      \*c) ☐ None of the:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_ .  
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* Certified copies not received: \_\_\_\_ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirement for corrected drawings noted in item 6 below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.** See 37 CFR 1.85(c). **NOTE: This notice does not set or reset the time period for paying the issue fee.**

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

**Attachment(s)**

1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4. <input type="checkbox"/> Examiner's Amendment/Comment
2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Receipt Date (2)8/6/2019	5. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance
3. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date ____ .	6. <input type="checkbox"/> Other ____ .

<b>NOTE:</b> ____	/Paula A. Greene/ Primary Examiner AU 2912
	/PAULA Allen GREENE/ Primary Examiner, Art Unit 2912



<b>Notice of References Cited</b>	Application/Control No. 29/700,875		Applicant(s)/Patent Under Reexamination Cho et al.	
	Examiner PAULA Allen GREENE		Art Unit 2912	Page 1 of 2

## U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-D860319-S	09-2019	Beruto; Olav		D20/10
*	B	US-D819607-S	06-2018	Chui; Kenny		D14/225
*	C	US-D811393-S	02-2018	Ahn; Sung Sang		D14/371
*	D	US-D285067-S	08-1986	Delbuck; Pascal		D14/209
*	E	US-5359374-A	10-1994	Schwartz; Jeffrey M.	A47G1/0616	40/455
*	F	US-6757393-B1	06-2004	Spitzer; Marie L.	H04R5/02	381/77
*	G	US-4029170-A	06-1977	Phillips; Jesse O.	H04R1/02	181/155
*	H	US-2950556-A	08-1960	DANIEL LARIOS	A47G1/0633	40/788
*	I	US-20090003586-A1	01-2009	Lai; Shien-Neng	H04M9/082	379/406.01
*	J	US-20090129609-A1	05-2009	Oh; Kwang-cheol	H04R1/406	381/92
*	K	US-20160300584-A1	10-2016	Pandey; Ashutosh	H04R3/005	1/1
*	L	US-20160302002-A1	10-2016	Lambert; David K.	H04R3/04	1/1
*	M	US-20160302006-A1	10-2016	Pandey; Ashutosh	H04R3/005	1/1

## FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
*	N	D0784299	04-2017	US	Cho, Elizabeth Ara Shure Aquisitions	
*	O	300888582	12-2016	KR	Cho, Elizabeth Ara Shure Aquisitions	
*	P	300856915	05-2016	KR	Cho, Elizabeth Ara Shure Acquisitions	
	Q					
	R					
	S					
	T					

## NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	V	
	W	
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<b><i>Notice of References Cited</i></b>	Application/Control No. 29/700,875		Applicant(s)/Patent Under Reexamination Cho et al.	
	Examiner PAULA Allen GREENE		Art Unit 2912	Page 2 of 2

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20170134849-A1	05-2017	Pandey; Ashutosh	H04R3/005	1/1
*	B	US-20170134850-A1	05-2017	Graham; Derek L.	H04R1/406	1/1
*	C	US-20180160224-A1	06-2018	Graham; Derek L.	H04R3/04	1/1
	D					
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	I					
	J					
	K					
	L					
	M					


**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

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	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<b><i>Search Notes</i></b> 	<b>Application/Control No.</b> 29/700,875	<b>Applicant(s)/Patent Under Reexamination</b> Cho et al.
	<b>Examiner</b> PAULA Allen GREENE	<b>Art Unit</b> 2912

CPC - Searched*		
Symbol	Date	Examiner
H04R1/02,H04R25/00,H04R5/02,H04R1/20,H04R9/06,H04R1/24,H04R7/18,H04R1/40,H04R1/406,H04R31/00,H04R2201/021,H04R2201/40	09/17/2019,9/19/2019	/P.G./


CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
D14	225,209,126,204,214,210,211,219,221,250,209.1,224,224.1	09/17/2019,9/19/2019	/P.G./
D23	388	09/19/2019	/P.G./
D6	300,308	09/19/2019	/P.G./
181	144,145,147,148,150,157,198,199,141,164,172,173	09/19/2019	/P.G./
381	300,301,334,364,388,391,345,395,386,310,356,332,345,347	09/19/2019	/P.G./
379	202.01	09/19/2019	/P.G./
181	157	09/19/2019	/P.G./
312	114	09/19/2019	/P.G./
248	220.22	09/19/2019	/P.G./

\* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

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<b><i>Search Notes</i></b> 	<b>Application/Control No.</b> 29/700,875	<b>Applicant(s)/Patent Under Reexamination</b> Cho et al.
	<b>Examiner</b> PAULA Allen GREENE	<b>Art Unit</b> 2912

Search Notes		
Search Notes	Date	Examiner
H04R1/02,H04R25/00,H04R5/02,H04R1/20,H04R9/06,H04R1/24,H04R7/18,H04R1/40,H04R1/406,H04R31/00,H04R2201/021,H04R2201/40	09/17/2019,9/19/2019	/P.G./
Inventor Search	09/19/2019	/P.G./
Google image search	09/19/2019	/P.G./
Orbit search	09/19/2019	/P.G./

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
D14	225	09/19/2019	/P.G./
D14	209	09/19/2019	/P.G./


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<b><i>Issue Classification</i></b> 	<b>Application/Control No.</b> 29/700,875	<b>Applicant(s)/Patent Under Reexamination</b> Cho et al.
	<b>Examiner</b> PAULA Allen GREENE	<b>Art Unit</b> 2912

<b>CPC</b>		
<b>Symbol</b>	<b>Type</b>	<b>Version</b>

<b>CPC Combination Sets</b>				
<b>Symbol</b>	<b>Type</b>	<b>Set</b>	<b>Ranking</b>	<b>Version</b>

Use images from artifact folder? <input type="radio"/> Yes <input checked="" type="radio"/> No			
NONE (Assistant Examiner)		<b>Total Claims Allowed:</b> 1	
/PAULA Allen GREENE/ Primary Examiner, Art Unit 2912 (Primary Examiner)		19 September 2019 (Date) O.G. Print Claim(s) (Figs.1-6)	
		O.G. Print Figure 1,6	

<b>Issue Classification</b> 	<b>Application/Control No.</b> 29/700,875	<b>Applicant(s)/Patent Under Reexamination</b> Cho et al.
	<b>Examiner</b> PAULA Allen GREENE	<b>Art Unit</b> 2912

<b>INTERNATIONAL CLASSIFICATION</b>			
<b>CLAIMED</b>			
	/	14	/ 01


<b>NON-CLAIMED</b>			
	/		/

<b>US ORIGINAL CLASSIFICATION</b>	
<b>CLASS</b>	<b>SUBCLASS</b>
D14	225

<b>CROSS REFERENCES(S)</b>						
<b>CLASS</b>	<b>SUBCLASS (ONE SUBCLASS PER BLOCK)</b>					
D14	209					

Use images from artifact folder? <input type="radio"/> Yes <input checked="" type="radio"/> No			
NONE		<b>Total Claims Allowed:</b>	
(Assistant Examiner)	(Date)	1	
/PAULA Allen GREENE/ Primary Examiner, Art Unit 2912	19 September 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	(Figs.1-6)	1,6



<b>Issue Classification</b> 	<b>Application/Control No.</b> 29/700,875	<b>Applicant(s)/Patent Under Reexamination</b> Cho et al.
	<b>Examiner</b> PAULA Allen GREENE	<b>Art Unit</b> 2912

<input checked="" type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47															
<b>CLAIMS</b>															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

Use images from artifact folder? <input checked="" type="radio"/> Yes <input checked="" type="radio"/> No			
NONE (Assistant Examiner)		<b>Total Claims Allowed:</b> 1	
/PAULA Allen GREENE/ Primary Examiner, Art Unit 2912 (Primary Examiner)		19 September 2019 (Date)	O.G. Print Claim(s) (Figs.1-6)
			O.G. Print Figure 1,6

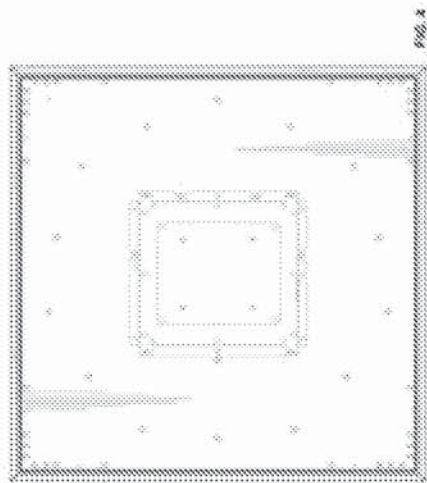
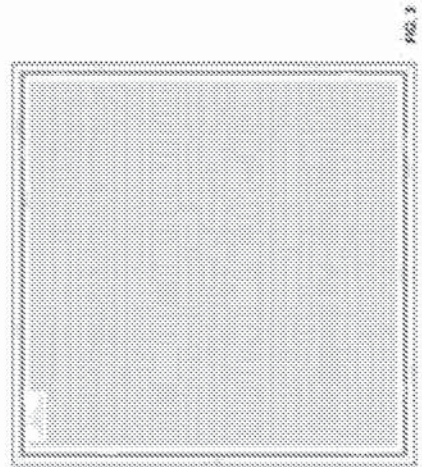
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1/1-DESIGNS-©Questel

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2017-04-18



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20\*27\*56



FIG. 1



FIG. 2



FIG. 3

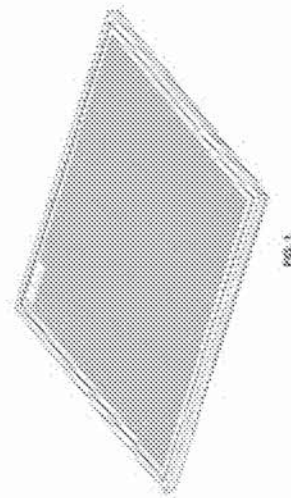
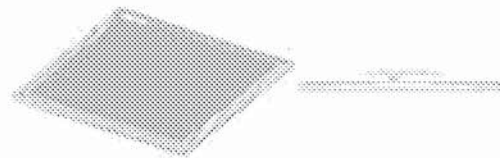


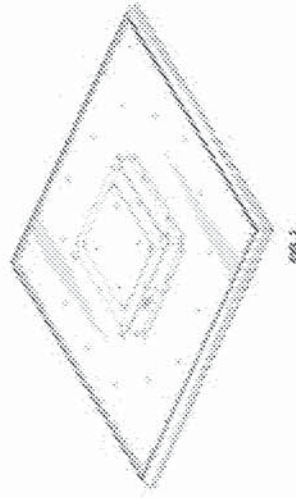
FIG. 5



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RGN - D0784299  
 CCDB - US  
 ET - **Array microphone** assembly  
 CL - 14-01  
 CLN - D14/225; D14/209  
 CL1 - D14/225; D14/209  
 CLS - D14/225; D14/209  
 OWN - Shure Acquisition Holdings Inc, Niles, IL, (US)  
 ROLE - Niles, IL  
 IN - Cho Elizabeth Ahra, Wilmette, IL, (US)  
       Lantz Gregory William, Aurora, IL, (US)  
       Miller John Matthew, Grayslake, IL, (US)  
 INVA - Cho Elizabeth Ahra; Lantz Gregory William; Miller John Matthew  
 REP - Lenz, Esq. William J., Neal Gerber & Eisenberg LLP  
 REPT - Neal Gerber & Eisenberg LLP  
 APN - 29525639  
 APD - 2015-04-30  
 RGD - 2017-04-18  
 PD - 2017-04-18  
 DESC - The ornamental design for an array microphone assembly, as shown and described.

FIG. 1 is a front perspective view of the array microphone assembly in accordance with the present invention;  
 FIG. 2 is a rear perspective view thereof;  
 FIG. 3 is a front plan view thereof;  
 FIG. 4 is a rear plan view thereof;  
 FIG. 5 is a first side elevation view thereof;  
 FIG. 6 is a second side elevation view thereof, opposite from the first side elevation view; and,  
 FIG. 7 is a third side elevation view thereof.  
 The broken lines in the drawings illustrate the portions of the design that form no part of the claim.

DPP - 14

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NUM - 1  
PCL - D14/225; D14/126; D14/204; D14/214; D14/210; D14/211; D14/219; D14/221; D14/250;  
D14/209.1; D14/224; D14/224.1; D14/209; D23/388; D6/308; D6/300; 181/144; 181/145;  
181/147; 181/148; 181/150; 181/157; 181/198; 181/199; 181/141; 181/164; 181/172; 181/173;  
381/300; 381/301; 381/334; 381/364; 381/388; 381/391; 381/345; 381/395; 381/386  
EXAM - Greene Paula, 2912

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (2)</b>  <i>(Use as many sheets as necessary)</i>			<b>Complete if Known</b>		
			Application Number	Not Yet Assigned	
			Filing Date	Herewith	
			First Named Inventor	Elizabeth Ahra CHO	
			Art Unit	Not Yet Assigned	
Examiner Name	Not Yet Assigned				
Sheet	1	of	3	Attorney Docket Number	15119.0002-01000

U.S. PATENTS					
Examiner Initials <sup>1</sup>	Cite No. <sup>1</sup>	Document Number	Issue or Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
/P.A.G./		US-1965830	07-10-1934	Hammer	
/P.A.G./		US-2521603	09-05-1950	Prew	
/P.A.G./		US-2533565	12-12-1950	Eichelman	
/P.A.G./		US-2840181	06-24-1958	Wildman	
/P.A.G./		US-2912605	11-10-1959	Tibbetts	
/P.A.G./		US-2938113	05-24-1960	Schnell et al.	
/P.A.G./		US-3019854	02-06-1962	O'Bryant	
/P.A.G./		US-3143182	08-04-1964	Sears et al.	
/P.A.G./		US-3161975	12-22-1964	McMillan, J.L.	
/P.A.G./		US-3205601	09-14-1965	Gawne et al.	
/P.A.G./		US-3509290	04-28-1970	Mochida et al.	
/P.A.G./		US-3857191	12-31-1974	Sadorus, George P.	
/P.A.G./		US-3938617	02-17-1976	Forbes, Lonnie R.	
/P.A.G./		US-3941638	03-02-1976	Horky et al.	
/P.A.G./		US-4008408	02-15-1977	Kodama, Akihiko	
/P.A.G./		US-4029170	06-14-1977	Phillips, Jesse O.	
/P.A.G./		US-4032725	06-28-1977	McGee, Paul Dean	
/P.A.G./		US-4244096	01-13-1981	Kashichi, Hirota	
/P.A.G./		US-4518826	05-21-1985	Caudill et al.	
/P.A.G./		US-4566557	01-28-1986	Lemaitre, Guy	
/P.A.G./		US-4969197	11-06-1990	Takaya, Tadashi	
/P.A.G./		US-5038935	08-13-1991	Wenkman et al.	
/P.A.G./		US-5322979	06-21-1994	Cassity et al.	
/P.A.G./		US-5359374	10-25-1994	Schwartz, Jeffrey M.	
/P.A.G./		US-5383293	01-24-1995	Royal, John D.	
/P.A.G./		US-5400413	03-21-1995	Kindel, William J.	
/P.A.G./		US-6035962	03-14-2000	Lin, Chih-Hsiung	
/P.A.G./		US-6144746	11-07-2000	Azima et al.	
/P.A.G./		US-6198831	03-06-2001	Azima et al.	
/P.A.G./		US-6266427	07-24-2001	Mathur, Gopal P.	
/P.A.G./		US-6285770	09-04-2001	Azima et al.	
/P.A.G./		US-6393129	05-21-2002	Conrad et al.	
/P.A.G./		US-6993145	01-31-2006	Combest, Christopher	
/P.A.G./		US-7387151	06-17-2008	Payne, Donald L.	



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (2)</b>  <i>(Use as many sheets as necessary)</i>			<b>Complete if Known</b>		
			Application Number	Not Yet Assigned	
			Filing Date	Herewith	
			First Named Inventor	Elizabeth Ahra CHO	
			Art Unit	Not Yet Assigned	
			Examiner Name	Not Yet Assigned	
Sheet	2	of	3	Attorney Docket Number	15119.0002-01000

U.S. PATENTS				
/P.A.G./	US-7565949	07-28-2009	Tojo, Makoto	
/P.A.G./	US-8064629	11-22-2011	Jiang, Peigen	
/P.A.G./	US-8670581	03-11-2014	Harman	
/P.A.G./	US-D255234	06-03-1980	Wellward et al.	
/P.A.G./	US-D256015	07-22-1980	Doherty, Glenn F.	
/P.A.G./	US-D329239	09-08-1992	Hahn, Richard	
/P.A.G./	US-D340718	10-26-1993	Leger et al.	
/P.A.G./	US-D345346	03-22-1994	Alfonso et al.	
/P.A.G./	US-D345379	03-22-1994	Chan, Robert J.	
/P.A.G./	US-D363045	10-10-1995	Phillips et al.	
/P.A.G./	US-D392977	03-31-1998	Kim, Byung Hwa	
/P.A.G./	US-D394061	05-05-1998	Fink, David	
/P.A.G./	US-D424538	05-09-2000	Hayashi et al.	
/P.A.G./	US-D432518	10-24-2000	Muto, Keiko	
/P.A.G./	US-D453016	01-22-2002	Nevill et al.	
/P.A.G./	US-D489707	05-11-2004	Kobayashi, Tomohiko	
/P.A.G./	US-D504889	12-19-2014	Andre et al.	
/P.A.G./	US-D526643	08-15-2006	Ishizaki, Hideaki	
/P.A.G./	US-D527372	08-29-2006	Allen, Graham David	
/P.A.G./	US-D542543	05-15-2007	Bruce, David	
/P.A.G./	US-D546318	07-10-2007	Yoon et al.	
/P.A.G./	US-D547748	07-31-2007	Tsuge, Takahiro	
/P.A.G./	US-D549673	08-28-2007	Niitsu, Takuya	
/P.A.G./	US-D552570	10-09-2007	Niitsu, Takuya	
/P.A.G./	US-D599553	01-15-2008	Mischel, Jr.	
/P.A.G./	US-D566685	04-15-2008	Koller et al.	
/P.A.G./	US-D587709	03-03-2009	Niitsu et al.	
/P.A.G./	US-D589605	03-31-2009	Reedy et al.	
/P.A.G./	US-D595736	07-07-2009	Son et al.	
/P.A.G./	US-D613338	04-06-2010	Marukos, Chris	
/P.A.G./	US-D614871	05-04-2010	Tang et al.	
/P.A.G./	US-D636188	04-19-2011	Kim et al.	
/P.A.G./	US-D642385	08-02-2011	Lee et al.	
/P.A.G./	US-D685346	07-02-2013	Szymanski et al.	
/P.A.G./	US-D717272	11-11-2014	Kim et al.	
/P.A.G./	US-D725631	03-31-2015	McNamara, Greg	

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (2)</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Elizabeth Ahra CHO
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	3	of	3	Attorney Docket Number	15119.0002-01000

U.S. PATENTS				
/P.A.G./	US-D726144	04-07-2015	Kang, Hwayoung	
/P.A.G./	US-D729767	05-19-2015	Lee et al.	
/P.A.G./	US-D737245	08-25-2015	Fan et al.	
/P.A.G./	US-D743376	11-17-2015	Kim, Junki	
/P.A.G./	US-D743939	11-24-2015	Seong, Bo-Kyung	
/P.A.G./	US-D754103	04-19-2016	Fischer et al.	

U.S. PUBLISHED PATENT APPLICATIONS					
Examiner Initials <sup>*</sup>	Cite No. <sup>3</sup>	Document Number	Issue or Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>4</sup> (if known)			
/P.A.G./		US-20060159293	07-20-2006	Azima et al.	
/P.A.G./		US-20060198541	09-07-2006	Henry, Todd	
/P.A.G./		US-20060215866	09-28-2006	Francisco et al.	
/P.A.G./		US-20090087001	04-02-2009	Jiang	
/P.A.G./		US-20100011644	01-21-2010	Kramer, Eric J.	
/P.A.G./		US-20140233777	08-21-2014	Tseng et al.	

**Note: Submission of copies of U.S. Patents and published U.S. Patent Applications is not required.**

FOREIGN PATENT DOCUMENTS						
Examiner Initials <sup>*</sup>	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	Translation <sup>8</sup>
		Country Code <sup>5</sup> Number <sup>6</sup> Kind Code <sup>7</sup> (if known)				

NONPATENT LITERATURE DOCUMENTS			
Examiner Initials <sup>*</sup>	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	Translation <sup>6</sup>
		Office Action issued for Japanese Patent Application No. 2015-023781 dated Jun. 20, 2016	

Examiner Signature	/PAULA Allen GREENE/ (09/17/2019)	Date Considered	09/17/2019
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EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /P.A.G./



PTO Notes regarding this form:

<sup>1</sup> Applicant's unique citation designation number (optional).

<sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.

<sup>3</sup> Applicant's unique citation designation number (optional).

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<sup>5</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).

<sup>6</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

<sup>7</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible.

<sup>8</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /P.A.G./



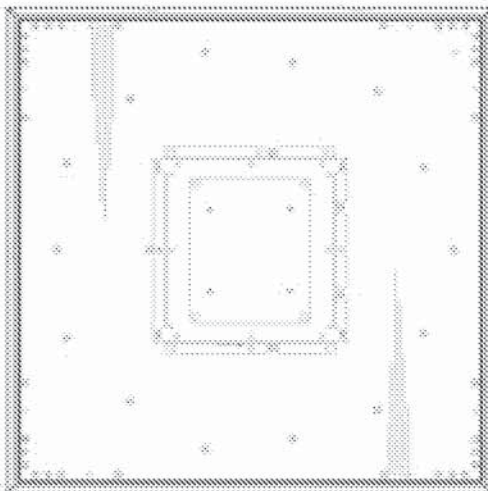
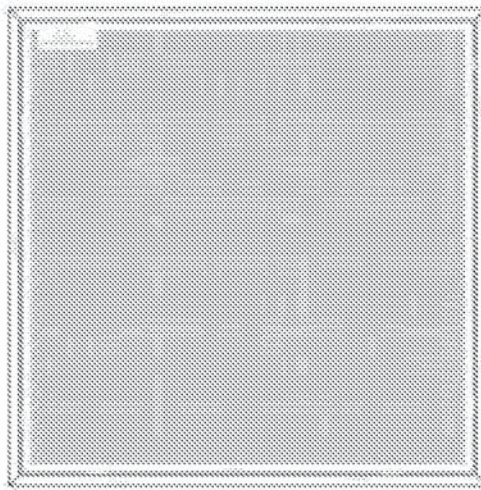
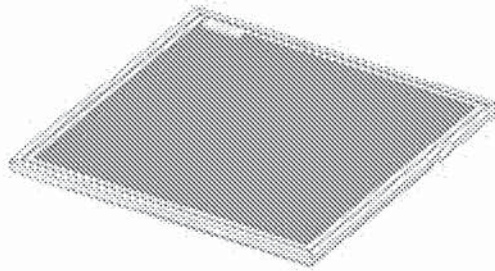
19/09/19

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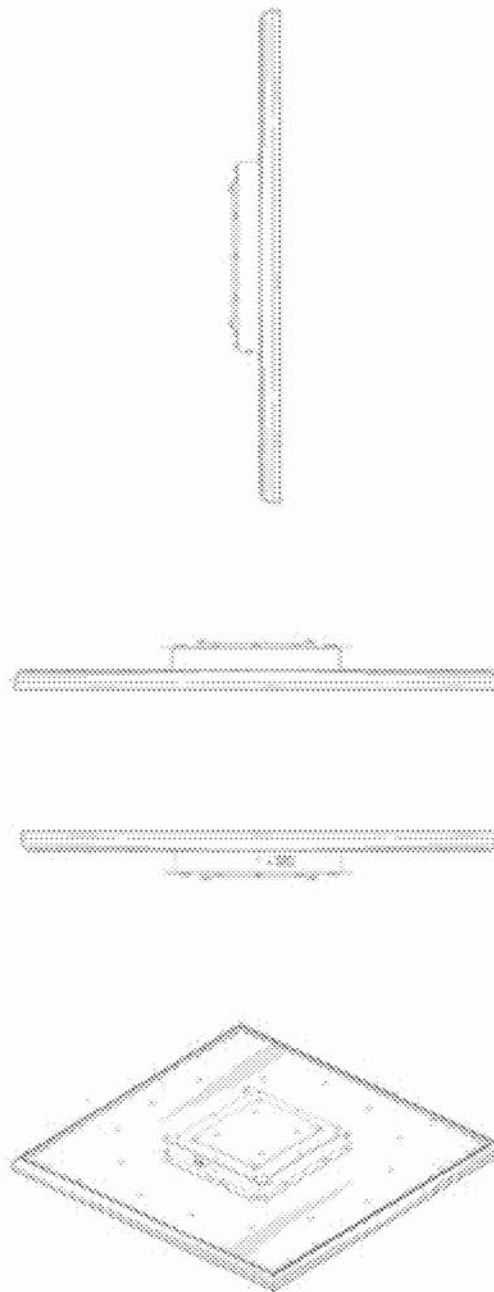
300856915  
2016-05-26



19/09/19

2

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RGN	- 300856915.0000
CCDB	- KR
ET	- <b>Array Microphone</b> Assembly District
OTI	- 어레이 마이크로폰 조립구
CL	- 14-01
CLN	- H4-119; H4-110
CL1	- H4-119; H4-110
CLS	- H4-119; H4-110

19/09/19

3

20\*30\*29

OWN - SHURE ACQUISITION HOLDINGS INC, (US)  
 OWNO - , 미국 일리노이 닐스 웨스트 투히 애버뉴 5800 (우편번호: 60714-4608)  
 IN - Elizabeth Ara Article, (US)  
 Gregory William rancheu, (US)  
 John Matthew Miller, (US)  
 INO - 엘리자베스 아라 조, 미국 일리노이 (우편번호 60091) 윌메트 유니트 에이 윌메트 애비뉴 1829  
 그레고리 윌리엄 란츠, 미국 일리노이 (우편번호 60506) 오로라 웨스트 갈레나 블러바드 664  
 존 매튜 밀러, 미국 일리노이 (우편번호 60030) 그레이슬레이크 해리스 로드 891  
 INVA - Elizabeth Ara Article; Gregory William rancheu; John Matthew Miller  
 REP - KIM YOUNG  
 YANG YOUNG JUN  
 REPO - 김영  
 양영준  
 REPC - 김영; 양영준  
 APN - 3020150053819  
 APD - 2015-10-26  
 RGD - 2016-05-26  
 PR - US, 2015-04-30, 29/525,639  
 PRD - 2015-04-30  
 PRC - US  
 PD - 2016-06-01  
 DESC - 1. The material is plastic, metal Lim.  
 2. The part represented by the solid line as a part being designed to receive part of the design registration.  
 3. Broken wire represented in the drawings is not an express line or configure the appearance of design as a shaded line.  
 4. [FIG. 1. Box 1] 2 being also the strabismus which expresses the form which design is whole.  
 5. [FIG. 1. 2 is a representation of the front part of the design will.  
 6. [FIG. 1. 3] expresses the will of the rear part of the design.  
 7. [FIG. 1. 4] Is the image of the left side of the design.  
 8. [FIG. 1. 5 is a representation of a flat portion of the design will.  
 9. [FIG. 1. 6] expresses the will of the bottom part of the design.  
 10. [FIG. 1. 7] is a rear perspective view of the image of the whole being designed in the form of.  
 "Array microphone assembly phrase" yo shape and the shape of the combination of creative design, contents  
 Do a point.  
 ODES - 1. 재질은 합성수지, 금속임.  
 2. 실선으로 표현된 부분이 부분디자인으로서 디자인 등록을 받고자 하는 부분임.  
 3. 도면상에 표현된 끊어진 세선은 음영선으로써 디자인의 모양을 표현 또는 구성하는 선이 아님.  
 4. [도면 1.1]은 디자인의 전체적인 형태를 표현한 사시도임.  
 5. [도면 1.2]는 디자인의 정면부분을 표현한 것임.  
 6. [도면 1.3]은 디자인의 배면부분을 표현한 것임.  
 7. [도면 1.4]는 디자인의 좌측면부분을 표현한 것임.  
 8. [도면 1.5]는 디자인의 평면부분을 표현한 것임.  
 9. [도면 1.6]은 디자인의 저면부분을 표현한 것임.  
 10. [도면 1.7]은 디자인의 전체적인 형태를 표현한 배면사시도임.  
 "어레이 마이크로폰 조립구"의 형상과 모양의 결합을 디자인창작 내용의 요  
 점으로 함.  
 NUM - 1  
 EXAM - KANG KYUNG HO  
 EXAO - 강경호



## EAST Search History

## EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	997	H04R1/02.cpc.	USPAT	OR	OFF	2019/09/19 13:26
L2	1367	((381/332) or (381/356) or (381/310) or (381/122)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 13:31
L3	9	("2891629"   "2917127"   "3143182"   "3239028"   "3938617").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 13:35
L4	641	((381/345) or (381/347)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 13:37
L5	546	H04R25/00.cpc.	USPAT	OR	OFF	2019/09/19 13:42
L6	1455	H04R5/02.cpc.	USPAT	OR	OFF	2019/09/19 13:43
L7	116	H04R1/20.cpc.	USPAT	OR	OFF	2019/09/19 13:47
L8	1231	H04R9/06.cpc.	USPAT	OR	OFF	2019/09/19 13:49
L9	9	("4072314"   "4541188"   "4923032"   "5209665"   "5359374"   "5402502"   "5794371"   "5864627"   "D402985").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 13:53
L10	16	("3691312"   "3857191"   "4222188"   "4318188"   "4389541"   "4541188"   "4602296"   "4611262"   "4636881"   "4791741"   "4809246"   "4905029"   "4983996"   "4990092"   "5045327"   "5247126").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 13:54
L11	4790	379/202.01	USPAT	OR	OFF	2019/09/19 14:00
L12	0	(379/202/01).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 14:00
L13	1689	(379/202.01).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 14:01
L14	795	(312/114).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 14:02
L15	568	H04R1/04.cpc.	USPAT	OR	OFF	2019/09/19 14:03
L16	0	H04R1/1021.cpc.	USPAT	OR	OFF	2019/09/19 14:08
L17	585	H04R1/24.cpc.	USPAT	OR	OFF	2019/09/19 14:09
L18	84	H04R1/40.cpc.	USPAT	OR	OFF	2019/09/19 14:13
L19	352	H04R7/18.cpc.	USPAT	OR	OFF	2019/09/19 14:16



L20	274	(248/220.22).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 14:18
L21	4826	((455/90.3) or (455/575.1) or (455/569.1)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 14:21
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L23	722	H04R31/00.cpc.	USPAT	OR	OFF	2019/09/19 14:51
L24	344	H04R2201/021.cpc.	USPAT	OR	OFF	2019/09/19 14:52
L25	49	H04R2201/40.cpc.	USPAT	OR	OFF	2019/09/19 14:53
L26	1	("D860319").PN.	USPAT; USOCR	OR	OFF	2019/09/19 15:11
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S3	1430	(D14/223).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 05:38
S4	556	(D24/174).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 05:38
S5	420	((128/865) or (128/866) or (128/867)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 05:38
S6	1084	((181/129) or (181/130) or (181/135)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 05:39
S7	778	((379/430) or (379/431)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 05:39
S8	930	((381/380) or (381/381)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 05:40
S9	4826	((455/90.3) or (455/575.1) or (455/569.1)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 05:40
S10	476	H04R1/10.cpc.	USPAT	OR	OFF	2019/09/19 05:42
S11	546	H04R25/00.cpc.	USPAT	OR	OFF	2019/09/19 05:42
S12	730	H04R1/1066.cpc.	USPAT	OR	OFF	2019/09/19 05:43
S13	1534	H04R1/1016.cpc.	USPAT	OR	OFF	2019/09/19 05:44



S14	1236	H04R5/033.cpc.	USPAT	OR	OFF	2019/09/19 05:44
S15	646	H04R5/0335.cpc.	USPAT	OR	OFF	2019/09/19 05:45
S16	65	("20060039574"   "20110176699"   "20140205125"   "20160037248"   "4375016"   "6920344"   "6922476"   "7062057"   "7542564"   "7680267"   "8285208"   "D389139"   "D519101"   "D529901"   "D536692"   "D538271"   "D539787"   "D543972"   "D550215"   "D552596"   "D553613"   "D555151"   "D559836"   "D566103"   "D566692"   "D568301"   "D573582"   "D573982"   "D573983"   "D574367"   "D578111"   "D579924"   "D579925"   "D581396"   "D582897"   "D583805"   "D584283"   "D588113"   "D590377"   "D594443"   "D596165"   "D596166"   "D597084"   "D597534"   "D598900"   "D602007"   "D604722"   "D637183"   "D640242"   "D649957"   "D676026"   "D693796"   "D699215"   "D700905"   "D702732"   "D705757"   "D711356"   "D782442"   "D785594"   "D788079"   "D790501"   "D800097"   "D801950"   "D808360"   "D840372").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 05:49
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S18	39	("20110142276"   "20110176699"   "20140064548"   "20140205125"   "6625469"   "7949127"   "8229154"   "8983108"   "D176810"   "D177346"   "D321881"   "D350961"   "D452857"   "D464638"   "D469755"   "D529901"   "D543972"   "D559837"   "D574814"   "D579006"   "D597534"   "D603380"   "D618211"   "D621817"   "D635558"   "D652817"   "D660292"   "D666581"   "D681602"   "D699215"   "D705757"   "D711356"	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 05:52



		"D729775"   "D733103"   "D735169"   "D773439"   "D777710").PN.				
S19	21	("D357921"   "D402661"   "D539268"   "D554627"   "D566099"   "D572703"   "D579005"   "D587681"   "D587685"   "D589493"   "D590375"   "D594441"   "D599778"   "D599779"   "D602004"   "D616874"   "D618211"   "D623171"   "D626948"   "D627763"   "D628193").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 05:53
S20	18	("1830198"   "2430229"   "3068954"   "3170046"   "3368644"   "3408461"   "3470328"   "3702123"   "3934100"   "4069400").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 05:58
S21	57	("2248837"   "2430229"   "3440365"   "5410608"   "5654530"   "6386314"   "6445805"   "6493453"   "7536362"   "8831266"   "D338530"   "D367113"   "D466497"   "D479834"   "D512410"   "D524295"   "D538268"   "D550657"   "D557009"   "D562808"   "D568304"   "D579006"   "D592182"   "D597084"   "D598003"   "D599781"   "D626117"   "D631470"   "D634300"   "D641010"   "D641011"   "D652822"   "D666581"   "D668244"   "D673140"   "D697058"   "D711858"   "D712882"   "D717772"   "D718286"   "D732508"   "D742861"   "D746792"   "D764445"   "D781269"   "D787477"   "D789909"   "D790501"   "D795225"   "D795835"   "D801301"   "D807322"   "D830992"   "D831620").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:00
S22	25	("6574345"   "8391536"   "8831266"   "D431553"   "D487077"   "D554627"   "D555152"   "D557689"   "D599781"   "D606971"   "D626117"   "D641011"   "D643833"   "D660290"   "D666996"   "D668244"   "D686597"   "D689471"   "D697058"   "D710334"   "D712882"   "D717772"   "D718286"   "D718744"   "D719548").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:01
S23	25	("8831266"   "D531169"   "D549688"   "D554627"   "D587681"   "D600675"   "D606971"   "D614168"   "D626117"   "D635957"   "D642163"   "D643833"   "D647081"   "D664951"   "D673522"   "D678251"   "D680102"   "D690685"   "D697058"   "D698750"   "D701196"   "D702667"   "D703192"   "D710334"   "D711858").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:01
S24	30	("2430229"   "6574345"   "7551748"   "8265323"   "8391536"   "D457514"   "D519108"   "D564495"   "D572703"   "D598894"   "D602475"   "D606971"   "D621389"   "D626117"   "D626948"   "D631034"   "D635558"   "D647081"   "D663291"   "D664951"   "D668244"   "D674376"   "D674377"   "D674904"   "D678251"   "D683332"   "D683334"   "D685767"   "D686597").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:02
S25	19	("3440365"   "6386314"   "D367113"   "D531169"   "D566099"   "D593537"   "D597084"   "D618211"   "D623630"	US- PGPUB; USPAT;	OR	OFF	2019/09/19 06:03



		"D626117"   "D631470"   "D632677"   "D635558"   "D637998"   "D641010"   "D641011"   "D643414"   "D652817").PN.	USOCR			
S26	13	("6704429"   "D315350"   "D539268"   "D554627"   "D555152"   "D566099"   "D567217"   "D585050"   "D587681"   "D589493"   "D597084"   "D634300"   "D635960").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:03
S27	7	("4375016"   "5259033"   "D206162"   "D213109"   "D338530").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:04
S28	55	("1852130"   "20040101151"   "20130259286"   "2248837"   "2971065"   "3821647"   "4069400"   "4702238"   "5054079"   "5812680"   "6122388"   "7120267"   "9055369"   "D266271"   "D287280"   "D287764"   "D287765"   "D304944"   "D481709"   "D505411"   "D532520"   "D550657"   "D559837"   "D568290"   "D579006"   "D603380"   "D641010"   "D654056"   "D666581"   "D698026"   "D699226"   "D702668"   "D711356"   "D719132"   "D725082"   "D733101"   "D733102"   "D735169"   "D764445"   "D777710"   "D781269"   "D782997"   "D782998"   "D795225"   "D806879"   "D810047"   "D812042"   "D813205"   "D813206"   "D813848"   "D843354").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:23
S29	16	("20150237436"   "20150237439"   "20180063620"   "D621388"   "D677653"   "D690685"   "D697612"   "D803186"   "D806685"   "D820811"   "D824363"   "D824364"   "D829321"   "D830995"   "D830998"   "D830999").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:25
S30	42	("20110317864"   "20150237436"   "2145449"   "6574345"   "8391536"   "D230280"   "D241881"   "D259279"   "D318670"   "D326655"   "D334043"   "D431553"   "D435036"   "D460432"   "D464945"   "D466100"   "D467240"   "D468301"   "D487077"   "D554627"   "D555152"   "D567217"   "D621388"   "D627338"   "D633482"   "D637585"   "D647888"   "D660290"   "D667818"   "D674377"   "D676417"   "D680102"   "D690685"   "D718286"   "D719548"   "D733101"   "D784298"   "D784962"   "D786221").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:26
S31	35	("2089619"   "2145449"   "3060440"   "4041558"   "7551748"   "D360121"   "D371302"   "D474171"   "D519108"   "D531169"   "D539268"   "D567217"   "D587681"   "D591721"   "D594441"   "D595268"   "D598894"   "D606971"   "D611934"   "D618211"   "D623630"   "D624056"   "D627338"   "D629395"   "D635558"   "D637585"   "D639282"   "D639283"   "D642163"   "D643416"   "D647081"   "D656491").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:27
S32	31	("1353822"   "1566845"   "2117823"   "3177682"   "D037993"   "D166621"   "D369555"   "D431553"   "D485548"	US- PGPUB; USPAT;	OR	OFF	2019/09/19 06:29



		"D487077"   "D587681"   "D589493"   "D591721"   "D591722"   "D594365"   "D600675"   "D602905"   "D606971"   "D611934"   "D618670"   "D623630"   "D627338"   "D633086"   "D637181"   "D637585").PN.	USOCR			
S33	33	("0490459"   "1764987"   "1936290"   "2446622"   "2612222"   "2961108"   "3782574"   "4123576"   "D037993"   "D052489"   "D101218"   "D122057"   "D152155"   "D157883"   "D300551"   "D334224"   "D352441"   "D369555"   "D405342"   "D572703"   "D593716").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:29
S34	92	("1312493"   "1624144"   "1668890"   "1668910"   "20070263896"   "20110293130"   "20120114160"   "2377739"   "2595672"   "2754365"   "2805332"   "2910679"   "2971065"   "3234467"   "3440365"   "3457375"   "3730181"   "3821647"   "4069400"   "4457396"   "4539708"   "4585089"   "5054079"   "6122388"   "7120267"   "8275166"   "8776801"   "8983108"   "9087506"   "9131308"   "9565491"   "D215675"   "D236988"   "D287764"   "D287765"   "D295173"   "D321881"   "D348066"   "D417465"   "D477593"   "D477822"   "D481709"   "D505411"   "D519108"   "D588111"   "D603380"   "D637997"   "D637999"   "D641010"   "D652817"   "D652822"   "D654056"   "D666581"   "D685764"   "D699226"   "D711356"   "D719550"   "D725082"   "D726145"   "D727871"   "D733102"   "D735169"   "D742861"   "D764445"   "D773032"   "D777710"   "D778267"   "D781269"   "D782997"   "D782998"   "D788079"   "D798843"   "D800097"   "D806879"   "D813206"   "D818990").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:32
S35	62	("20110211723"   "20120087532"   "20140140561"   "4981194"   "5410608"   "6386314"   "8111861"   "8660287"   "8712087"   "8831266"   "D431553"   "D487077"   "D517054"   "D531169"   "D539268"   "D554627"   "D558735"   "D566099"   "D567217"   "D572703"   "D573978"   "D576154"   "D587681"   "D591264"   "D598901"   "D599785"   "D605636"   "D626117"   "D628193"   "D632677"   "D635558"   "D641010"   "D641011"   "D643414"   "D647081"   "D653235"   "D668244"   "D678251"   "D679267"   "D680102"   "D683332"   "D686597"   "D697058"   "D701195"   "D707652"   "D710334"   "D711356"   "D712882"   "D718284"   "D718286"   "D725082"   "D732508"   "D732509"   "D733101"   "D735169"   "D739851"   "D741287"   "D742860"   "D746268"   "D746792"   "D762196"   "D762616").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:33
S36	40	("20040101151"   "20130259286"   "3440365"   "6386314"   "6868284"   "7079664"   "7248902"   "9055369"   "D367113"	US- PGPUB; USPAT;	OR	OFF	2019/09/19 06:36



		"D494568"   "D494570"   "D497613"   "D531169"   "D566099"   "D587248"   "D593537"   "D597084"   "D618211"   "D623630"   "D626117"   "D631470"   "D632677"   "D634300"   "D634736"   "D635558"   "D637998"   "D641010"   "D641011"   "D643414"   "D652817"   "D668244"   "D693795"   "D705757"   "D743949"   "D764445"   "D788079"   "D801950"   "D810054"   "D813848").PN.	USOCR			
S37	45	("20090304220"   "20130259286"   "20170026738"   "3440365"   "9510076"   "D207206"   "D479834"   "D480386"   "D496653"   "D512990"   "D536692"   "D550657"   "D555150"   "D559836"   "D595272"   "D597084"   "D597534"   "D604722"   "D622855"   "D631470"   "D652822"   "D658157"   "D666580"   "D676026"   "D684699"   "D684700"   "D685481"   "D711356"   "D742861"   "D764445"   "D767532"   "D786216"   "D788079"   "D799452"   "D801950"   "D806879"   "D808360"   "D812042"   "D813205"   "D817309"   "D822646"   "D824359"   "D827616").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:37
S38	56	("20110155147"   "20120087532"   "20180035193"   "2430229"   "3061689"   "3209082"   "3234467"   "3270146"   "3440365"   "4069400"   "4375016"   "5654530"   "6836676"   "8406448"   "8776801"   "8983108"   "D338530"   "D367113"   "D469411"   "D519108"   "D519985"   "D543972"   "D574814"   "D595268"   "D603380"   "D628565"   "D631470"   "D632677"   "D643833"   "D660292"   "D666581"   "D673532"   "D674490"   "D676026"   "D685770"   "D705758"   "D711356"   "D711858"   "D735169"   "D737251"   "D742861"   "D743949"   "D764445"   "D777710"   "D798843"   "D806879"   "D810054"   "D813205"   "D813848"   "D817309").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:37
S39	52	("1852130"   "20170094384"   "2248837"   "2971065"   "3821647"   "4069400"   "4702238"   "5054079"   "5812680"   "6122388"   "7120267"   "8275166"   "8776801"   "8983108"   "D206665"   "D266271"   "D287280"   "D287764"   "D287765"   "D304944"   "D481709"   "D505411"   "D532520"   "D550657"   "D559837"   "D568290"   "D579006"   "D603380"   "D641010"   "D654056"   "D666581"   "D698026"   "D699226"   "D725082"   "D733102"   "D735169"   "D764445"   "D777710"   "D781269"   "D782269"   "D782997"   "D782998"   "D795225"   "D806879"   "D812042"   "D813205"   "D813848").PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:40
S40	113	("1528080"   "20070116319"   "20090181082"   "20090296975"   "20110155147"   "20120087532"   "20130077815"   "20160073186"   "20160261946"   "20170094384"   "2430229"   "2478376"	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:42



		"3440365"   "4579112"   "5579669"   "5659156"   "6122369"   "6122388"   "6386314"   "6482516"   "8175315"   "8743533"   "D206665"   "D206797"   "D258091"   "D275842"   "D317593"   "D326655"   "D339806"   "D351828"   "D366262"   "D395891"   "D406187"   "D409510"   "D415496"   "D421014"   "D424577"   "D427994"   "D435580"   "D439574"   "D483281"   "D496638"   "D500485"   "D511768"   "D532520"   "D535642"   "D550202"   "D557624"   "D565033"   "D566537"   "D569841"   "D572703"   "D575277"   "D578508"   "D584284"   "D591274"   "D594442"   "D597084"   "D599778"   "D604269"   "D604722"   "D605170"   "D605628"   "D637183"   "D640242"   "D641010"   "D643830"   "D647081"   "D649957"   "D652822"   "D658157"   "D666580"   "D668244"   "D671523"   "D673140"   "D673531"   "D698026"   "D698750"   "D711356"   "D712884"   "D722040"   "D725625"   "D726145"   "D727871"   "D732509"   "D739852"   "D742861"   "D743381"   "D743949"   "D745489"   "D756959"   "D764445"   "D767532"   "D774490"   "D775609"   "D776641"   "D776642"   "D780154"   "D780714"   "D780721"   "D786216"   "D788603"   "D790501"   "D795109"   "D797079"   "D817920"   "D818457") .PN.				
S41	40	("2474135"   "4917504"   "5210792"   "5412736"   "5625171"   "7231056"   "7570777"   "7648005"   "7708110"   "8265328"   "D179150"   "D375959"   "D383757"   "D462943"   "D469081"   "D470129"   "D471537"   "D472890"   "D490398"   "D501196"   "D504673"   "D506994"   "D508911"   "D510085"   "D510575"   "D511156"   "D512984"   "D543968"   "D567217"   "D601126"   "D603847"   "D617778"   "D624529"   "D635960"   "D636763"   "D639787"   "D645454"   "D740255") .PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:45
S42	30	("20020021800"   "2248837"   "2474135"   "5613222"   "5748743"   "5787166"   "6122388"   "6359995"   "6688421"   "7110535"   "7620173"   "7708110"   "7949127"   "7986803"   "8776801"   "D461791"   "D462943"   "D469755"   "D470122"   "D470123"   "D470129"   "D510085"   "D514094"   "D543968"   "D584284"   "D618219"   "D641008"   "D712884") .PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:46
S43	24	("3124663"   "3374318"   "3852540"   "3983336"   "4073366"   "4456795"   "4532649"   "4706778"   "4716985"   "4739512"   "4831655"   "4852177"   "4879750"   "4953215"   "4977976"   "4984277"   "4985925"   "4987597"   "5046580"   "5185802"   "5201008"   "5327500") .PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:47



S44	3	("3842829"   "3852540"   "4879750").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:48
S45	38	("4891276"   "D357921"   "D402661"   "D431553"   "D449330"   "D451527"   "D472913"   "D474171"   "D485548"   "D487077"   "D502202"   "D539268"   "D554627"   "D566099"   "D572703"   "D579005"   "D584293"   "D586332"   "D587249"   "D587681"   "D587685"   "D589493"   "D590375"   "D594441"   "D598431"   "D599778"   "D599779"   "D601548"   "D602004"   "D604272"   "D616874"   "D618211"   "D623171"   "D626117"   "D626948"   "D627763"   "D628193"   "D635558").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:55
S46	21	("7289640"   "7551748"   "D237090"   "D242724"   "D316550"   "D337118"   "D337119"   "D543968"   "D554627"   "D569841"   "D572703"   "D572706"   "D576154"   "D587681"   "D598894"   "D599778"   "D605636"   "D606971"   "D614168"   "D618670").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 06:57
S47	13	("D240453"   "D479834"   "D504125"   "D504884"   "D509210"   "D512991"   "D514549"   "D526313"   "D528531"   "D538268"   "D538792"   "D549686").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 07:00
S48	6	("6127933"   "6728518"   "D340453"   "D344949"   "D453924"   "D485254").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 07:01
S49	10	("5748743"   "5784471"   "D206162"   "D367113"   "D455835"   "D612058"   "D622855"   "D635676"   "D719549").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/19 07:06
S50	1205	((381/324) or (381/322)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 08:29
S51	4826	((455/90.3) or (455/575.1) or (455/569.1)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 08:39
S52	1430	(D14/223).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 09:15
S53	461	(D14/225).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 09:21
S54	3552	((D14/209) or (D14/126) or (D14/204)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 09:24
S55	2301	((D14/214) or (D14/210) or (D14/211) or (D14/219)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 09:25
S56	2707	((D14/221) or (D14/250) or (D14/209.1) or (D14/224)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 09:25
S57	17	(D14/224.1).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 09:26
S58	46	(D23/288).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 09:26
S59	1938	((D6/308) or (D6/300)).CCLS.	USPAT; USOCR	OR	OFF	2019/09/19 09:26
S61	546	H04R25/00.cpc.	USPAT	OR	OFF	2019/09/19 09:28



S62	1455	H04R5/02.cpc.	USPAT	OR	OFF	2019/09/19 09:28
S63	116	H04R1/20.cpc.	USPAT	OR	OFF	2019/09/19 09:29
S64	1231	H04R9/06.cpc.	USPAT	OR	OFF	2019/09/19 09:30
S65	585	H04R1/24.cpc.	USPAT	OR	OFF	2019/09/19 09:30
S66	352	H04R7/18.cpc.	USPAT	OR	OFF	2019/09/19 09:31
S67	211	("10244219"   "1965830"   "20020015500"   "20020041679"   "20020131580"   "20020149070"   "20030053639"   "20030059061"   "20030063762"   "20030107478"   "20030118200"   "20030138119"   "20030161485"   "20030185404"   "20040013038"   "20040013252"   "20040105557"   "20040125942"   "20040240664"   "20050094580"   "20050094795"   "20050149320"   "20050175189"   "20050213747"   "20050271221"   "20050286698"   "20060088173"   "20060104458"   "20060151256"   "20060159293"   "20060165242"   "20060192976"   "20060198541"   "20060215866"   "20060233353"   "20060239471"   "20060262942"   "20060269080"   "20070053524"   "20070093714"   "20070116255"   "20070120029"   "20070165871"   "20070230712"   "20080056517"   "20080101622"   "20080130907"   "20080144848"   "20080232607"   "20080247567"   "20080259731"   "20080260175"   "20080285772"   "20090003586"   "20090030536"   "20090052684"   "20090087000"   "20090087001"   "20090129609"   "20090147967"   "20090150149"   "20090169027"   "20090274318"   "20090310794"   "20100011644"   "20100034397"   "20100074433"   "20100111324"   "20100119097"   "20100128892"   "20100131749"   "20100150364"   "20100189275"   "20100202628"   "20100215184"   "20100217590"   "20100314513"   "20110007921"   "20110038229"   "20110096915"   "20110164761"   "20110194719"   "20110211706"   "20110311064"   "20110311085"   "20110317862"   "20120002835"   "20120027227"   "20120076316"   "20120080260"   "20120093344"   "20120128160"   "20120128175"   "20120155688"   "20120169826"   "20120177219"   "20120182429"   "20120224709"   "20120243698"   "20120262536"   "20120288079"   "20120288114"   "20120294472"   "20120327115"   "20130004013"	US- PGPUB; USPAT	OR	OFF	2019/09/19 09:32



		"20130015014"   "20130016847"   "20130029684"   "20130034241"   "20130039504"   "20130083911"   "20130094689"   "20130101141"   "20130136274"   "20130206501"   "20130251181"   "20130264144"   "20130271559"   "20130336516"   "20130343549"   "20140016794"   "20140072151"   "20140098964"   "20140233777"   "20140264654"   "20140265774"   "20140270271"   "20140286518"   "20140301586"   "20140307882"   "20140341392"   "20140357177"   "201410233777"   "20150030172"   "20150055796"   "20150055797"   "20150070188"   "20150078581"   "20150078582"   "20150117672"   "20150118960"   "20150126255"   "20150281832"   "20150281833"   "20150350621"   "20160029120"   "20160031700"   "20160080867"   "20160111109"   "20160142548"   "20160142815"   "20160148057"   "20160150316"   "20160234593"   "20160295279"   "20160300584"   "20160302002"   "20160302006"   "20160323668"   "20160330545"   "20160337523"   "20160353200"   "20170019744"   "20170105066"   "20170134849"   "20170134850"   "20170164101"   "20170180861"   "20170264999"   "20170374454"   "20180160224"   "2521603"   "2533565"   "2840181"   "2912605"   "2938113"   "3019854"   "3143182"   "3161975"   "3205601"   "3509290"   "3755625"   "3857191"   "3906431"   "3938617"   "3941638"   "4008408"   "4029170"   "4032725"   "4070547"   "4072821"   "4096353"   "4131760"   "4184048"   "4198705"   "4212133"   "4237339"   "4244096"   "4254417"   "4305141"   "4308425"   "4311874"   "4330691"   "4334740"   "4365449"   "4414433"   "4436966"   "4449238"   "4466117"   "4485484"   "4489442"   "4518826").PN.				
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9/ 19/ 2019 3:13:24 PM

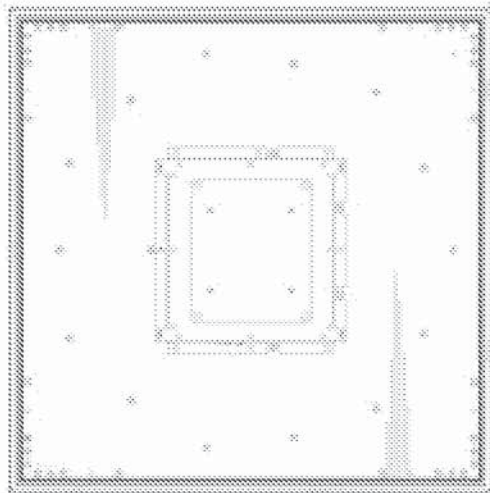
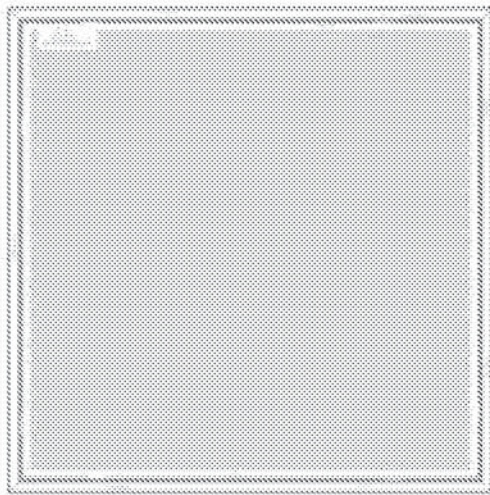
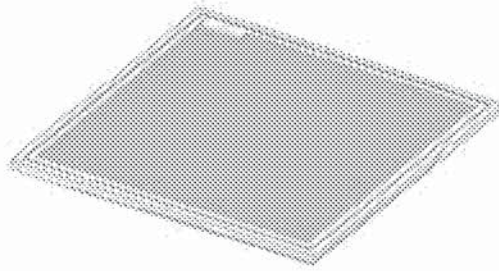
19/09/19

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1/1-DESIGNS-©Questel

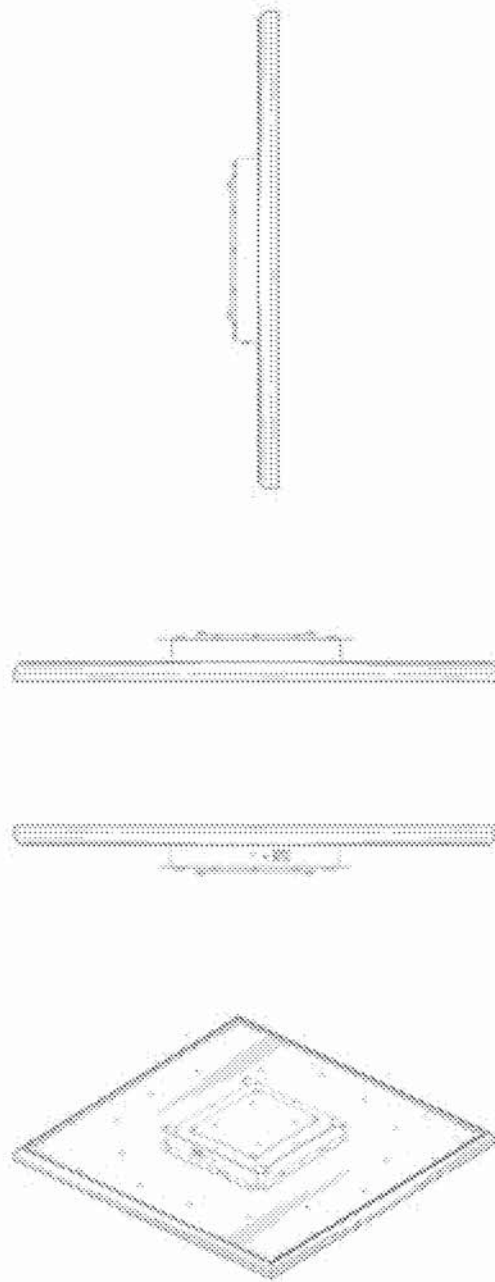
300888582  
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19/09/19

2

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RGN - 300888582.0000  
 CCDB - KR  
 ET - **Array Microphone** Assembly District  
 OTI - 어레이 마이크론 조립구  
 CL - 14-01  
 CLN - H4-119; H4-110  
 CL1 - H4-119; H4-110  
 CLS - H4-119; H4-110



19/09/19

3

20\*28\*49

OWN - Shure Acquisition Holdings Inc, (US)  
 OWNO - , 미국 일리노이 닐스 웨스트 투히 애버뉴 5800 (우편번호: 60714-4608)  
 IN - Elizabeth Ara Article, (US)  
 Gregory William rancheu, (US)  
 John Matthew Miller, (US)  
 INO - 엘리자베스 아라 조, 미국 일리노이 (우편번호 60091) 월메트 유니트 에이 월메트 애비뉴 1829  
 그레고리 윌리엄 란츠, 미국 일리노이 (우편번호 60506) 오로라 웨스트 갈레나 블러바드 664  
 존 매튜 밀러, 미국 일리노이 (우편번호 60030) 그레이슬레이크 해리스 로드 891  
 INVA - Elizabeth Ara Article; Gregory William rancheu; John Matthew Miller  
 REP - KIM Young  
 YANG Young June  
 REPO - 김영  
 양영준  
 REPC - 김영; 양영준  
 APN - 3020150053820  
 APD - 2015-10-26  
 RGD - 2016-12-27  
 PR - US, 2015-04-30, 29/525,639  
 PRD - 2015-04-30  
 PRC - US  
 PD - 2017-01-02  
 DESC - 1. The material is plastic, metal Lim.  
 2. A portion intended to be designed as a register design portion is part expressed with a solid line, a portion expressed by dotted lines, including small circular interior of the rectangular seen from the front is not the portion to receive the registered design.  
 3. A broken wire is not represented on the drawing lines to represent the shape or configuration of the shading lines by design.  
 4. [Diagram 1. 1] is a perspective view representing the whole being designed in the form of.  
 5. [Diagram 1. 2 - Is a representation of the front part of the design.  
 6. [Diagram 1. 3 is the image of the back surface portion of the design shall.  
 7. [Diagram 1. 4] Is the image of the left side portion of the design.  
 8. [Diagram 1. 5 Is the image of the flat portion of the design.  
 9. [Diagram 1. 6 is the image of the bottom portion of the design shall.  
 10. [Diagram 1. 7] is a rear perspective view of the image of the whole being designed in the form of.  
 "Array microphone assembly phrase" yo shape and the shape of the combination of creative design, contents  
 Do a point.  
 ODES - 1. 재질은 합성수지, 금속임.  
 2. 실선으로 표현된 부분이 부분디자인으로서 디자인 등록을 받고자 하는 부분이며, 정면에서 보이는 직사각형 내부의 작은 원형을 포함한 점선으로 표현된 부분은 디자인 등록을 받고자 하는 부분이 아님.  
 3. 도면상에 표현된 끊어진 세선은 음영선으로써 디자인의 모양을 표현 또는 구성하는 선이 아님.  
 4. [도면 1.1]은 디자인의 전체적인 형태를 표현한 사시도임.  
 5. [도면 1.2]는 디자인의 정면부분을 표현한 것임.  
 6. [도면 1.3]은 디자인의 배면부분을 표현한 것임.  
 7. [도면 1.4]는 디자인의 좌측면부분을 표현한 것임.  
 8. [도면 1.5]는 디자인의 평면부분을 표현한 것임.  
 9. [도면 1.6]은 디자인의 저면부분을 표현한 것임.  
 10. [도면 1.7]은 디자인의 전체적인 형태를 표현한 배면사시도임.  
 "어레이 마이크로폰 조립구"의 형상과 모양의 결합을 디자인창작 내용의 요점으로 함.  
 NUM - 1  
 EXAM - KIM JIHOON  
 EXAO - 김지훈

**Bibliographic Data**

Application No: 29/700,875

Foreign Priority claimed: ☐ Yes ☒ No35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /PAULA Allen GREENE/

Examiner's Signature

Initials

Title: ARRAY MICROPHONE ASSEMBLY

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FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
08/06/2019	D14	2912	15119.0002-01000
<b>RULE</b>			

**APPLICANTS**

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Gregory William Lantz Aurora, IL, UNITED STATES

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**CONTINUING DATA**

This application is a CON of 15833404 12/06/2017

15833404 is a CON of 15631310 06/23/2017ABN

15631310 is a CON of 15403765 01/11/2017ABN

15403765 is a CON of 14701376 04/30/2015 PAT 9565493

**FOREIGN APPLICATIONS****IF REQUIRED, FOREIGN LICENSE GRANTED\*\***

08/08/2019

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\$1,860

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>			<b>Complete if Known</b>	
			Application Number	Not Yet Assigned
			Filing Date	Herewith
			First Named Inventor	Elizabeth Ahra CHO
			Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned			
Attorney Docket Number	15119.0002-01000			
Sheet	1	of	20	

U.S. PATENTS					
Examiner Initials <sup>1</sup>	Cite No. <sup>1</sup>	Document Number	Issue or Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
/P.A.G./		US-3755625	08-28-1973	MASTON, D	
/P.A.G./		US-3906431	09-16-1975	CLEARWATERS, WALTER L	
/P.A.G./		US-4070547	01-24-1978	DELLAR, FRED JAY	
/P.A.G./		US-4072821	02-07-1978	Bauer, Benjamin B.	
/P.A.G./		US-4096353	06-20-1978	BAUER, BENJAMIN B	
/P.A.G./		US-4131760	12-26-1978	CHRISTENSEN, SUSAN W	
/P.A.G./		US-4184048	01-15-1980	Alcaide, Andre	
/P.A.G./		US-4198705	04-15-1980	MASSA, FRANK	
/P.A.G./		US-4212133	07-15-1980	Lufkin, Lindsey D.	
/P.A.G./		US-4237339	12-02-1980	BUNTING, JOHN G	
/P.A.G./		US-4254417	03-03-1981	SPEISER, JEFFREY M	
/P.A.G./		US-4305141	12-08-1981	MASSA, FRANK	
/P.A.G./		US-4308425	12-29-1981	MOMOSE, CHIKAHIDE	
/P.A.G./		US-4311874	01-19-1982	Wallace, Jr., Robert L.	
/P.A.G./		US-4330691	05-18-1982	Gordon, Theodore J.	
/P.A.G./		US-4334740	06-15-1982	WRAY, WILLIAM R	
/P.A.G./		US-4365449	12-28-1982	Liautaud, James P.	
/P.A.G./		US-4414433	11-08-1983	HORIE, MASAO	
/P.A.G./		US-4436966-A	03-13-1984	Botros; Radamis	
/P.A.G./		US-4449238	05-15-1984	LEE, BYUNG H	
/P.A.G./		US-4466117	08-14-1984	GOERIKE, RUDOLF	
/P.A.G./		US-4485484	11-27-1984	FLANAGAN, JAMES L	
/P.A.G./		US-4489442	12-18-1984	ANDERSON, CARL R	
/P.A.G./		US-4521908	06-04-1985	MIYAJI	
/P.A.G./		US-4593404	06-03-1986	Bolin, Gustav	
/P.A.G./		US-4653102	03-24-1987	HANSEN, PER K	
/P.A.G./		US-4658425	04-14-1987	JULSTROM	
/P.A.G./		US-4669108	05-26-1987	DEINZER, GERALD J	
/P.A.G./		US-4696043	09-22-1987	IWAHARA, MAKOTO	
/P.A.G./		US-4712231	12-08-1987	Julstrom, Stephen D.	
/P.A.G./		US-4741038	04-26-1988	ELKO, GARY W	
/P.A.G./		US-4752961	06-21-1988	KAHN, DAVID A	
/P.A.G./		US-4815132	03-21-1989	MINAMI, SHIGENOBU	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /P.A.G./



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT (1)</b>  <i>(Use as many sheets as necessary)</i>			<b>Complete if Known</b>		
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			Art Unit	Not Yet Assigned	
			Examiner Name	Not Yet Assigned	
Sheet	2	of	20	Attorney Docket Number	15119.0002-01000

U.S. PATENTS					
/P.A.G./	US-4860366	08-22-1989	FUKUSHI, YUZO		
/P.A.G./	US-4881135	11-14-1989	Heilweil, Jordan B.		
/P.A.G./	US-4903247	02-20-1990	VAN GERWEN, PETRUS J		
/P.A.G./	US-4923032	05-08-1990	Nuemberger, Mark A.		
/P.A.G./	US-4928312	05-22-1990	Hill, Amel		
/P.A.G./	US-5121426	06-09-1992	BAUMHAUER		
/P.A.G./	US-5214709	05-25-1993	RIBIC, ZLATAN		
/P.A.G./	US-5297210	03-22-1994	JULSTROM		
/P.A.G./	US-5323459	06-21-1994	Hirano		
/P.A.G./	US-5335011	08-02-1994	Addeo, Eric J.		
/P.A.G./	US-5371789	12-06-1994	Hirano		
/P.A.G./	US-5384843	01-24-1995	MASUDA, HIROYUKI		
/P.A.G./	US-5396554	03-07-1995	Hirano		
/P.A.G./	US-5473701	12-05-1995	CEZANNE, JUERGEN		
/P.A.G./	US-5513265	04-30-1996	Hirano		
/P.A.G./	US-5525765	06-11-1996	Freiheit, Ronald R.		
/P.A.G./	US-5550924	08-27-1996	Helf, Brant M.		
/P.A.G./	US-5574793	11-12-1996	Hirschhorn, Bruce D.		
/P.A.G./	US-5602962	02-11-1997	Kellermann, Walter		
/P.A.G./	US-5633936	05-27-1997	Oh, Stephen S.		
/P.A.G./	US-5661813	08-26-1997	Shimauchi		
/P.A.G./	US-5673327	09-30-1997	JULSTROM, STEPHEN D		
/P.A.G./	US-5687229	11-11-1997	Sih, Gilbert C.		
/P.A.G./	US-5706344	01-06-1998	Finn, Brian M.		
/P.A.G./	US-5761318	06-02-1998	Shimauchi		
/P.A.G./	US-5787183	07-28-1998	Chu, Peter Lee		
/P.A.G./	US-5796819	08-18-1998	Romesburg, Eric Douglas		
/P.A.G./	US-5848146	12-08-1998	Slattery, Ernest M.		
/P.A.G./	US-5870482	02-09-1999	Loeppert et al.		
/P.A.G./	US-5888412	03-30-1999	Sooriakumar et al.		
/P.A.G./	US-6041127	03-21-2000	Elko, Gary Wayne		
/P.A.G./	US-6049607	04-11-2000	Marash, Joseph		
/P.A.G./	US-6069961-A	05-30-2000	Nakazawa; Fumihiko		
/P.A.G./	US-6125179	09-26-2000	Wu, Ying		
/P.A.G./	US-6137887	10-24-2000	Anderson		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /P.A.G./

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Sheet	3	of	20	Attorney Docket Number	15119.0002-01000

U.S. PATENTS				
/P.A.G./	US-6173059-B1	01-09-2001	Huang, Jixiong	
/P.A.G./	US-6205224	03-20-2001	Underbrink, James R.	
/P.A.G./	US-6215881	04-10-2001	Azima, Henry	
/P.A.G./	US-6329908	12-11-2001	Frecska, Sandor A.	
/P.A.G./	US-6332029	12-18-2001	Azima, Henry Firouz	
/P.A.G./	US-6442272	08-27-2002	Osovets	
/P.A.G./	US-6449593	09-10-2002	Valve, Paeivi	
/P.A.G./	US-6488367	12-03-2002	Debesis et al.	
/P.A.G./	US-6505057	01-07-2003	Finn, Brian M.	
/P.A.G./	US-6556682	04-29-2003	Gilloire	
/P.A.G./	US-6704422	03-09-2004	Jensen, Lars Baekgaard	
/P.A.G./	US-6731334	05-04-2004	Maeng, Joonyoul	
/P.A.G./	US-6741720	05-25-2004	Myatt, Jeffrey D.	
/P.A.G./	US-6768795	07-27-2004	Feltstroem, Alberto Diego Jimen	
/P.A.G./	US-6885750	04-26-2005	Egelmeers, Gerardus Paul Maria	
/P.A.G./	US-6895093	05-17-2005	Ali	
/P.A.G./	US-6931123	08-16-2005	Hughes	
/P.A.G./	US-6944312	09-13-2005	Mason, John W.	
/P.A.G./	US-6968064	11-22-2005	Ning, Aidong	
/P.A.G./	US-6990193	01-24-2006	Beaucoup	
/P.A.G./	US-6993126	01-31-2006	Kyrylenko, Mykola	
/P.A.G./	US-7003099	02-21-2006	Zhang	
/P.A.G./	US-7031269	04-18-2006	Lee, Way-Shing	
/P.A.G./	US-7035415	04-25-2006	Belt, Harm Jan Willem	
/P.A.G./	US-7054451	05-30-2006	Janse, Cornelis Pieter	
/P.A.G./	US-7092516	08-15-2006	Furuta, Satoru	
/P.A.G./	US-7092882	08-15-2006	Arrowood, Jon A.	
/P.A.G./	US-7098865	08-29-2006	CHRISTENSEN, JACOB JUHL	
/P.A.G./	US-7120269	10-10-2006	Lowell, Wilhelm R.	
/P.A.G./	US-7269263	09-11-2007	Dedieu, Stephane	
/P.A.G./	US-7359504	04-15-2008	Reuss, Edward L.	
/P.A.G./	US-7503616	03-17-2009	Linhard, Klaus	
/P.A.G./	US-7536769	05-26-2009	Pedersen, Michael	
/P.A.G./	US-7660428	02-09-2010	Rodman, Jeffrey	
/P.A.G./	US-7701110	04-20-2010	Fukuda et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /P.A.G./